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HISTORICAL.

FRANÇA (Carlos). Os Portugueses da Renascença, a Medicina Tropical e a Parasitologia. [**The Portuguese of the Renaissance, [and their Contributions to] Tropical Medicine and Parasitology.**]—*Asoc. Española p. el Progr. d. l. Ciencias.* T.II : Conferencias. (Congreso de Coimbra.) pp. 187–218. Madrid. 1925. (Also printed in *O Instituto*, vol. 73, No. 1, and reprinted separately for the author. Coimbra. 1925. 43 pp.)

In this very interesting address, delivered at Coimbra on June 19th, 1925, will be found numerous references to important historical records which appear to have been almost wholly neglected hitherto. At the beginning the author remarks that it had always seemed to him surprising that Portuguese names figure so seldom in works on the history of science : and when we recall the prominent part played by Portuguese navigators and colonists in the early days of geographical discovery, it seems hardly credible that they should really have left no records of the tropical diseases and tropical parasites which they must so often have encountered. The author therefore turned to the old chroniclers of the voyages and conquests of his countrymen, and was rewarded by finding in their writings numerous references to matters of great interest to students of tropical medicine. Some of these he has collected and annotated in the present discourse.

In the introductory paragraphs brief mention will be found of some of the more notable contributions made to science by the Portuguese in the fifteenth and sixteenth centuries. They added much not only to our knowledge of cosmography—as is well known—but also made many discoveries in the domain of natural history in the narrower sense. " Portuguese participation in the advancement of the sciences during that period was, in reality, enormous." For example, they not only discovered or first described a great many exotic animals (such as the anteater, the sloth, the armadillo, the opossum, the tapir, and the mudfish), but also numerous useful or medicinal plants (such as the sweet potato, manioc, pineapple, copaiva, ipecacuanha, etc.), in whose cultivation and dispersal they also largely assisted. In this connexion the names of Gomes EANES DE AZURARA, JOÃO DOS SANTOS, Antonio GALVÃO, José DE ANCHIETA, Gabriel SOARES DE SOUSA, and Garcia DA ORTA receive honourable mention.

JOÃO DOS SANTOS, a Dominican missionary who visited East Africa in 1586, has moreover left us, in the account of his travels (published

in Portugal in 1609), an unmistakable—and probably the first—description of night-blindness. The disease is recorded as peculiar to Mozambique, where it afflicted Portuguese and natives alike.

João de Barros, who sailed with the immortal Vasco da Gama on his first voyage to India in 1497, gives a graphic description (published in 1552) of the terrible scurvy which visited their ships when lying off the East Coast of Africa. " . . . Many were stricken, whereof some died . . . Their gums were so swollen, that their mouths could scarce contain them, and they rotted till they cracked and burst, as if the flesh were dead : a thing most pitiful to see. And this affliction we afterwards found to be due to the consumption of meat, salt fish, and ship's biscuit, corrupted by overlong keeping."

Duarte Lopes, who explored the sources of the Nile and visited the Congo in 1578–1587, observed the Guinea-worm (*Dracunculus medinensis*) : while Aleixo de Abreu, in 1623, gave a further account, and described its extraction. He says " this worm is chiefly engendered in the legs of men, where it groweth in length and breadth to the bigness of a thick guitar-string. ' Tis cured by drawing it out, bit by bit, and winding it upon a little stick . . ."

The chigger (*Dermatophilus penetrans*) was described by Antonio Galvão, onetime governor of the Moluccas (*obiit* 1557) ; and by Gaspar Afonso, who went to Brazil in 1596—long before Piso, to whom its discovery is usually attributed. It was also described (in Brazil) by G. Soares de Sousa (1587) ; and these early records clearly indicate that its original home was the New World. But the Portuguese, in their turn, had learned of it from the South American Indians : and it is noteworthy that in the Tupi language it was called *tungaçù*, which means " big flea "—" which shows that the aborigines had an exact conception of its zoological affinities."*

G. Soares de Sousa (1587) and the Spaniard Nicolau Monardes de Sevilha (1580) have recorded cases, and described methods of cure, of various tropical myiases. " To the physicians of the Peninsula, particularly to the Portuguese, we undoubtedly owe the first accounts of myiasis, and notices of the parasiticidal properties of tobacco."

" *Mal do Bicho* " (=maggot-sickness) is a tropical disease almost exclusively described by early Portuguese writers. It was apparently prevalent, at one time, in Central Africa and in Brazil, and was probably —as Ricardo Jorge (1909) has recently pointed out—" a gangrenous rectitis associated with intestinal myiasis." Aleixo de Abreu (1623)—who himself suffered from this horrid infestation—and Soares de Sousa (1587) gave vivid descriptions of the disease.

The earliest Portuguese chroniclers have also noted many things (too numerous to mention) about snake-poison and snake-poisoning—their accounts being " of the most extraordinary perfection, and forestalling the discoveries of foreigners at the same and later periods."

Garcia da Orta and Gaspar Correia, furthermore, made many admirable observations on Asiatic cholera—duly noting such obvious symptoms as thirst and prostration, but not overlooking cyanosis of the nails of both hands and feet. (Several remarkable passages from their writings are quoted.)

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* It is interesting to note that the generic name which has a year's priority over *Dermatophilus* is *Tunga*, given by Jarocki as " one of the names under which this parasite is known to the natives in South America " [Rothschild : *Ectoparasites*, 1921, Vol. 1, p. 131 ; see also this *Bulletin*, Vol. 18, p. 205, where the name Jarocki appears by an error as Jorocki.]—Ed.

Some very early Portuguese and Spanish observations on syphilis—of whose New World origin the author was convinced—are next cited: and from among them may be mentioned a little-known passage from José DE ANCHIETA (1560), who tells us that the disease was supposed by the Indians of S. America to have been contracted from certain "hairy caterpillars . . . which they are wont to apply to their genital parts, in order to increase their sexual appetite."

The Brazilian planter G. SOARES DE SOUSA, who died by shipwreck on his way home to Portugal, also refers to yaws (1587), and ascribes its transmission to an as yet unidentified fly (*nhitinga*)—as the author (1921) has elsewhere indicated [see this *Bulletin*, vol. 18, p. 265]: while Dr. João FERREIRA DA ROSA, who went through a terrible Brazilian epidemic of yellow fever (ca. 1684–1691), has left a memorable account of this disease, which "he was the first to describe clearly and exactly."

The foregoing extracts do scant justice to the erudition of the author, and all interested in early records of tropical disease should read his discourse in the original. Those who do cannot fail to find much that will profit and entertain them, though at the same time they cannot fail to feel deeply sorrowful that the author did not live to amplify a story which is here all too briefly outlined.

Clifford Dobell.

BAUMANN (E. D.). Iets over de dysenterie in de zestiende en zeventiende eeuw. [**Notes on Dysentery in the XVI and XVII Centuries.**] —*Nederl. Tijdschr. v. Geneesk.* 1926. July 3. 70th Year. 2nd half. No. 1. pp. 41–59. [Numerous refs. in text and footnotes.]

This is an interesting if (as its title confesses) somewhat disjointed article, containing many useful references and quotations—few of which, however, have escaped the eye of HAESER and other medical historians.

The first few pages are occupied with annotations on various more or less familiar passages in the writings of the ancients—passages which have a bearing not upon the subject of "dysentery," but upon the development of the doctrine of *contagium vivum*. HIPPOCRATES, LUCRETIUS, VARRO, COLUMELLA, and the other classical physicians, versifiers, and farmers, are duly cited: but nothing novel relating to dysentery is disengaged from their often obscure and ambiguous remarks. It is, indeed, as the author says, frequently difficult to discover what the older writers meant by "dysentery." But as he himself nowhere defines the term, and discusses "dysentery" as though it were a single disease—not a mere symptom of several different conditions, as it obviously is—the reviewer has been unable to discover any line of argument (if there be one) running through these preliminary pages. The remainder of the article forms a somewhat discursive commentary upon certain selected publications—chiefly of the sixteenth and seventeenth centuries—relating to "dysentery" in the loosest sense, but containing many interesting allusions from which the following may be extracted as specially noteworthy.

In the sixteenth century there were, apparently, recurrent epidemics of "dysentery"—whatever the term may mean—in Europe; while a pandemic, from which hardly a town escaped, swept the continent in 1538. The Netherlands suffered severely in 1556 and 1580. One writer of the period—FERNELIUS (1497–1558)—ascribed the visitations,

in part, to an unknown baleful matter floating about in the air. PIETER VAN FOREEST (1522–1597) [known in his day as "the Dutch Hippocrates"], who wrote about the epidemic of 1556, regarded the disease as infectious when it assumed epidemic proportions; and for it he prescribed opium, hyoscyamus, and mandragora—though only in desperate cases. The great AMBROISE PARÉ (1510–1592) studied a severe outbreak in camp at Amiens (1558), and has left an account of his findings at several autopsies.

A German epidemic (1601–1603) was described by HILDANUS. Discussing the spread of infection, he says that it is dangerous for a healthy person to come in close contact with a dysenteric, or to use the same privy; and he advocates the disinfection of dysenteric stools with quicklime—though he did not, apparently, invent this method.

PASCHETTUS recorded an epidemic of dysentery at Genoa in 1604, and another Italian—FONTANUS (1612)—has left us a description of the *postmortem* examination of a child dead of the disease [which reads very like a case of *amoebic* dysentery].

Among French writers, LE POIS (1623) and DE LAMONIÈRE (1625) are specially noted. The latter gave a long account of the "nature, causes, and remedies" of dysentery, and remarked the occasional complication of liver-abscess. Somewhat later VAN DEN HEYDEN (1643) described an epidemic which broke out in Ghent in 1624. This writer regarded dysentery as infectious, and treated his patients by methods which seem by no means inappropriate for the alleviation of the bacillary form. Notable accounts of the 1624 epidemic were also published by the Dutch physicians VAN BEVERWIJCK (1660) and VAN DER MYE (1627), while SENNERT described an outbreak in the same year (1624) in Germany. Various views expressed by all these writers are recapitulated.

Later in the century WILLIS, SYDENHAM, and MORTON made their celebrated observations in England, and recorded their several opinions. These are briefly reviewed and illustrated. [The author does not mention, however, SYDENHAM'S memorable definition of (bacillary) dysentery as "a fever turned inwards upon the guts."]

The author finally treats of "tropical dysentery" (pp. 56–58), referring especially to various *loci classici* in the works of BONTIUS (1592–1631) and PISO (1611–1678), and devoting a few lines to ipecacuanha and its introduction into Europe. But he merely touches upon the fringe of this complicated and difficult subject, while reciting PISO'S famous panegyric on the "*salutifera et celeber radix.*"

As a result of his studies the author concludes that the sixteenth and seventeenth century writers on dysentery effectively contributed to our knowledge of infection and infectious diseases, and also to the development of the doctrine of *contagium vivum*; though he notes that, while the Arabians regarded dysentery as infectious, FRACASTORIUS—much later—did not so much as mention it in his well-known disquisition on contagion. AVICENNA was already aware that peritonitis might follow a dysenteric perforation of the intestine: PARÉ directly observed dysenteric ulceration of the colon: HILDANUS recognized that localization of pain in the belly and lesion in the gut are not necessarily coincident: DE LAMONIÈRE knew that dysentery might be associated with abscess of the liver. Finally, the seventeenth century gave us ipecacuanha—"*benedicta illa radix . . . praestans remedium . . . qua nullum praestantius aut tutius*"—as an approved remedy for the bloody flux.

Clifford Dobell.

BAUMANN (E. D.). Bijdragen tot de geschiedenis van de dysenterie in de achttiende eeuw. [**Contributions to the History of Dysentery in the XVIII Century.**]—*Nederl. Tijdschr. v. Geneesk.* 1926. Oct. 2. 70th Year. 2nd Half. No. 14. pp. 1520–1534. [Refs. in foot-notes.]

These historical " contributions " to the subject of " dysentery " are, apparently, not so much those of the author as of two English writers of the eighteenth century whose names are not unknown to students of the history of tropical medicine. The paper is, in fact, a sort of discursive and belated review of CLEGHORN's *Observations on the Epidemical Diseases in Minorca* (1751) and PRINGLE's *Observations on the Diseases of the Army* (1752)—with special, but by no means exclusive, reference to their accounts of dysentery. Various passages from these two classical works are reproduced and annotated, with frequent digressions into side-issues which are but remotely connected with the subject proper. (Some of these excursions are interesting enough, however—especially the author's notes on ancient army medical services and the origin of " the Red Cross idea.")

In his comments the author makes no attempt to interpret the words of either CLEGHORN or PRINGLE in the light of modern knowledge, and compares their observations with those of HIPPOCRATES and PLINY rather than with those of present-day investigators. For this reason his paper adds but little to what is already known—and has already been treated of at large by other writers—regarding the history of " the Bloody Flux."

Clifford Dobell.

HAUGHWOUT (Frank G.). **Woodward's Monograph on the Alvine Fluxes : a Forgotten Classic in the American Literature of Tropical Medicine.**—*Jl. Philippine Islands Med. Assoc.* 1926. July. Vol. 6. No. 7. pp. 218–223. [2 refs.]

The monograph is : 1. Medical and Surgical History of the War of the Rebellion. Part II. Vol. I. Medical History. Being the Second Medical Volume. Prepared under the direction of Joseph K. BARNES, Surgeon General, United States Army. By Joseph Janvier WOODWARD, Surgeon, United States Army. First Issue. Washington : Government Printing Office. 1879.

The author of this paper describes it as good to look on as an example of the printer's and engraver's art. Though written nearly half a century ago, it stands pre-eminent as a monograph, giving with rare completeness and accuracy the development of knowledge of dysentery, from which much useful information applicable to-day may be derived. Its 800 pages of solid fact and discussion are embellished by 51 plates and 44 text figures of surpassing execution.

The author was surprised to find how often WOODWARD's observations had anticipated much that is now regarded as of recent development. Medical experience remains constant. WOODWARD wrote :—

" Not only do the Alvine Fluxes usually cause more sickness and mortality among troops during war than any other group of diseases, but this circumstance affords a better opportunity for their study than can commonly be obtained in times of peace, so that it has heretofore happened that many of the most important accounts of these disorders, whether in ancient or modern times, have been the fruit of military experience"

One has only to consult the medical literature published since 1915 to see the truth of this. For the author, WOODWARD to-day sits on the Olympus of American medicine.

H. M. Hanschell.

MACARTHUR (W. P.). **Old-Time Plague in Britain.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1926. Jan. 21. Vol. 19. No. 7. pp. 355–371 ; also in *Jl. Roy. Army Med. Corps.* 1926. Dec. Vol. 47. No. 6. pp. 401–417.

Versed in curious history and old monastic chronicle, and aptly inspired by the poets, the author has staged here a panorama of Plague in Britain, where, as in the pages of Defoe, but in the exacter focus of science, we see affliction and agony in their feature, desolation in her own image, and the very atmosphere of the time in its lurid gloom and pressure. The lessons drawn from the story may not be entirely new, but they are not yet generally realized and understood, nor have they ever been expressed with such originality and distinction. Here we find ample historic illustration of the fact that from very early times in Britain, up to the end of the seventeenth century, plague must have been one of the endemic diseases of the land, and that the " Great Plague," so called, of 1665 was but the last of a long succession of its furious outbursts, some of which were sufficiently calamitous to have persisted as vividly in the memory of our earlier forefathers as it of 1665 did in the mind of later generations. Here, also, we get some striking illustration of the insanitary horrors of town-life in old England—particularly the familiar hordes of black rats and the dirt-whelmed lath-and-plaster houses that the unconcerned inhabitants shared with these exorbitant brutes and their parasites—horrors which provided all that was necessary for periodic explosions of the dormant infection. Here, too, it is well explained how this country got rid of plague—essentially a town-bred disease—by the awakening of a sanitary consciousness and the creation in towns of a sanitary environment repugnant to the house-haunting black rat. Incidentally, we find here well explained the lesson that the danger of a particular species of fleas is to be appraised not so entirely by the single fact that it is susceptible to plague-infection as by an adjunct knowledge of its relations to its specific host, of its habits and proclivities apart from that host, and of the habits and necessities of its larva ; while from old Scottish records read in the light of to-day the author shows that hen-fleas have acted—or at least have quite justly been said to have acted—in spreading plague in its most violent outbreaks.

These are the author's principal lessons—illustrated and impressed with an uncommon grace and erudition, and with many a winding bout of aptly-linked commerce with the poets. In unfolding them he first clears his course with a concise review of the relevant bionomy of fleas, and then follows on with the story, as far back as it can be traced, of the introduction of plague into Britain through continental Europe. In accord with custom he begins with the plague that reached Europe, A.D. 543, in the reign of Justinian, as the first *authentic record of bubonic plague* on the Continent. [This is the first record of bubonic plague in Europe, diagnosed and described by a contemporaneous physician, and the author may therefore, perhaps, be justified in excluding the unknown pestilence, comparable in its devastations with the Black Death itself, mentioned in Gibbon as having, between

A.D. 250 and A.D. 265, swept steadily through every province and city of the Roman Empire, entirely depopulating many cities, and as having, when it fell on Rome, carried off for some time there 5,000 persons daily.] The author considers with reason that the plague of Justinian must have spread to Britain, since, although it is not mentioned in the *Anglo-Saxon Chronicle*, it certainly reached Ireland, where he finds it recorded by the Irish chroniclers as bubonic plague, and as having destroyed "the noblest third of the human race." The first written record of plague in England occurs (A.D. 664) in the *Anglo-Saxon Chronicle*; this "pestilence" is mentioned also in BEDE'S *Ecclesiastical History*, where it is said to have done no less harm in Ireland than in England, and it may therefore, according to the author, be identified with concurrent Irish records of bubonic plague. After a cursory notice of other references to "plague" in the *Anglo-Saxon Chronicle*, the author gives a moving account of the "Black Death," the best contemporary description of which awful calamity is, according to him, that composed by a Franciscan friar of Kilkenny, John CLYN, who wrote as one—in his own pathetic words—"*inter mortuos mortem expectans*," and verily seems to have laid down pen and life together, since, as we here learn, his annals break off abruptly and are rounded with the cold statement, in different handwriting, that "here the author died." A cursory notice—with interesting commentary and some romantic allusion—of the great epidemic outbursts of the fifteenth and sixteenth centuries, in one of which (1625) the recorded deaths from plague in London rose to 4,000 a week, leads up to an instructive account of the culminating epidemic of the last tricennium of the seventeenth century, commonly but with intolerable laxity known as "*The* Great Plague of *London*," and an equally instructive discussion of the also much misunderstood manner of its extinction. And so, with a heart-searching conjuration to a world where the solemn words of the old familiar petition for divine deliverance "from plague and pestilence" have long ceased to be a motive and a cue for passion, and with a last mournful invocation of the stricken shade of poor Friar John of Kilkenny, *inter mortuos mortem expectans*, ends a discourse of which we may follow the outline and indicate the scope, but cannot abstract the tone and temper or the nice literary embellishment and scholarly antiquarian grace.

A. Alcock.

ICHOK (G.). La peste dans le passé et à notre époque. [**Plague in the Past and in our Time.**]—*Presse Méd.* 1926. Dec. 25. Vol. 34. No. 103. pp. 1627–1629. [6 refs.]

To throw into relief the victories of preventive medicine, and to show, at the same time, the campaigns still to be waged, Professor Ichok reviews briefly the history of plague in Europe, and then goes on to define the present world-distribution of the disease. He touches on the Plague of Justinian, the Black Death, and so forth, covering well-known ground, but devotes most space to the epidemic of plague, for so he identifies it, which raged in Athens 430 B.C. The reviewer is aware that the nature of the Pestilence of Athens has been discussed in the past—just as it will probably be the subject of debate in the future—but he has avoided reading any of the arguments on this point, so as to be able to consider THUCYDIDES' narrative, as given by JOWETT, uninfluenced by the opinion of others. The reviewer believes that

the epidemic undoubtedly was typhus fever. First, the circumstances of the Athens Pestilence were precisely those in which typhus breaks out. There was war, and famine; the country people flying before the ravaging Peloponnesian army swarmed into the city, aggravating its misery. Finding no other shelter, they crowded into stifling huts, and thronged even the temples. If the Athenians escaped typhus under these conditions their experience must be unexampled in the history of Europe.

However, to return to the symptomatic account* of THUCYDIDES, who himself "was attacked, and witnessed the sufferings of others." He describes a sudden onset with violent headache and with redness and inflammation in the eyes. The throat and tongue "were quickly suffused with blood" and the breath became foul. There followed sneezing and hoarseness, violent cough and distressing bilious vomiting. The body externally was not very hot to the touch, but of a livid colour inclining to red, and breaking out in pustules [φλύκταινι, or blisters] and ulcers. There was intense internal fever and wild delirium, so that many who were unguarded threw themselves into cisterns of water. An intolerable restlessness never left them. Those who expired on the seventh or ninth day had their strength unabated, and died of internal fever. In those who survived this, the disease descended into the bowels, and there produced violent ulceration with severe diarrhoea and an exhaustion which finally with few exceptions carried them away. If a person got over the worst, the disease often attacked the fingers and toes, destroying these, and some lost their eyes. Others on recovering were seized with a forgetfulness and knew neither themselves nor their friends. If an ordinary sickness attacked any, it ended in this pestilence. Contact with the sick was the principal cause of mortality; the physicians themselves were among the first victims because they most often came into contact with the disease.

There is little here to suggest plague, no mention of buboes, though these were known to the ancient Greeks; moreover, most cases of intense plague terminate fatally within five days.

An abrupt onset with redness of the eyes, as described, is of course usual in typhus. The reviewer is uncertain what to infer from the throat and tongue becoming "quickly suffused with blood"; there are no throat lesions peculiar to typhus, though oedema of the glottis, ulceration and necrosis occur occasionally in the course of the disease; one epidemic of typhus at the end of the seventeenth century is described as commonly characterized by a severe inflammation of the throat, ending in sloughing, the complication attaining its maximum severity at about the height of the petechial eruption.

Hoarseness is common, as are severe cough and vomiting, though forming no essential part of the symptomatology; even in the relatively mild type of typhus encountered by the Polish Commission (13 per cent. mortality), exhausting cough and severe vomiting were common symptoms. Some writers even mention a "bilious type" of the disease.

The body with intense internal fever, but not hot to the touch, is indicative of typhus, for in severe infections the temperature may fall without any amelioration of symptoms, and although the flushed skin and dull heavy facies of the patient suggest high fever, his temperature is normal.

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* Jowett's *Thucydides*, I., 125.

"Pustules and ulcers" may stand for sloughing parotid or submaxillary glands, or for gangrenous patches of skin; if the word translated in JOWETT's text by "pustules" was employed in its primary sense of blisters, these might well be the raised white miliary spots, quite distinct from the petechial rash, described so often in the eighteenth century.

Wild delirium, resistance to ministrations and attempts to escape out of doors are all to be expected in severe typhus before the patients subside into coma, or into coma-vigil—that "restlessness which never left them." As regards the intestinal complications described by Thucydides, thus PRINGLE in his account of the ghastly epidemics of typhus in the War of the Austrian Succession: "the intestines more particularly are disposed to mortify as few die without cadaverous and involuntary stools." Gangrene of the extremities is too frequent a complication of typhus to require comment.

The loss of sight may have been due to corneal ulceration, cataract, optic atrophy, or possibly to the occasional abscesses of the orbit. As a result of these complications, certain of DANIÉLOPOLU's Roumanian cases had their vision reduced to vague perception of light. Of such lesions in the Seven Years War, Donald MONRO wrote: "The Inflammation frequently rose to a great Height and left an Obscurity or Philm over the Cornea, which remained an Impediment to the Sight not to be removed."

Loss of memory and various other psychical abnormalities are a striking peculiarity of the typhus convalescence, and those affected may afterwards retain absolutely no recollection over some lengthy period during which they had appeared quite rational and sane.

The remaining sentences of the abstract record experiences so universally true of typhus that they might be applied indifferently to any epidemic of "the pestilential spotted fever" that has ever raged.

W. P. MacArthur.

COUDRAY (F. E. C.). Notes épidémiologiques du passé. La peste à l'armée d'Orient de la 1re République. [**Plague in the Army of the East of the First Republic.**]—*Arch. Méd. et Pharm. Milit.* 1926. Oct. Vol. 85. No. 4. pp. 387–403.

NAPOLEON'S Egyptian campaign was an undertaking arduous enough without the added harassment of persistent bubonic plague. The author of this paper does not attempt to give a detailed account of the epidemic, only drawing on its history to illustrate the character of DESGENETTES, Napoleon's principal medical officer, and to define his position as an organizer and as a sanitarian. DESGENETTES' main preoccupation was to protect the Army of the East against disease coming from without, and his arrangements towards this end would not discredit a hygienist of to-day. A special sanitary organization watched the ports; bureaus of hygiene were established over the country to keep him informed on the epidemic state of their districts. In spite of these precautions plague broke out, and from first to last attacked one-sixth of the force. DESGENETTES made vigorous efforts to limit the range of the epidemic; he transformed a large mosque in Alexandria into an observation hospital for suspected cases, organized two special hospitals for the definitely infected, and isolated the half-brigade of infantry most seriously involved. At this

point an expeditionary force of 15,000 men, all free from any sign of plague, was despatched to Syria, with NAPOLEON himself, accompanied by DESGENETTES, in command. At Jaffa plague broke out in the detached force; the special hospital filled so rapidly that another was organized forthwith. Most of the men attacked died in 5 days or less. So great was the panic that the dreaded word "plague" was barred and replaced by various euphemisms. NAPOLEON visited the plague hospitals—a most hazardous act according to the ideas of the time—and remained for a long time talking to the sick. Finding himself in a small and overcrowded room, he alarmed those responsible for his safety by helping to raise the corpse of a soldier whose rags were fouled by the discharge from a bubo. Here, too, DESGENETTES performed his famous "*geste*" of dipping his lancet into a suppurating bubo and then pricking himself in the groin and axilla with the contaminated blade. He escaped with no more serious result than local inflammation at the sites of inoculation, and his display of contempt for the disease had a very heartening effect on the despondent and sorely-tried troops.

On returning to Cairo, DESGENETTES set up an Extraordinary Commission of public health, with authority to issue any orders considered necessary—subject to the commander-in-chief's approval; the country was subdivided into districts, each in charge of a public health committee working under the direction of the central body. The organization was excellent, but executive measures based on erroneous etiological conceptions were bound to fail, and in spite of prompt notification, rigorous isolation and so forth, plague persisted for the whole of the campaign. The epidemic did not determine the issue in Egypt, for NAPOLEON's dream of conquest there ended with the Battle of the Nile; none the less, the sufferings and losses of the Army of the East may well have had some effect on his later fortunes. The author considers that by reason of the depth of their devotion, and of the magnitude of their services, the names of DESGENETTES and LARREY should be held in equal reverence.

W. P. MacArthur.

D'IRSAY (Stephen). **The Black Death and the Medieval Universities.**—*Ann. Med. History.* 1925. Vol. 7. pp. 220–225. [42 refs.]

In the fourteenth century the medical teaching of the universities was based on the elaborate system of philosophical speculation known as scholastic medicine. The attitude of the official medical theorists when confronted with the greatest pestilence that ever afflicted mankind, forms the subject of this scholarly paper. When the Black Death reached Paris in the autumn of 1348, the Faculty of Medicine in the University, on the request of the King, issued an official pronouncement concerning the epidemic. The cause is traced to various cosmic and telluric influences—the conjunction of Saturn and Jupiter, Mars was in the sign of the Lion, with consequent corruption of the air with evil vapours, and so forth. Here the imagination, trammelled only by the prescripts of the Fathers, has full play. But the inadequacy of the system becomes still more evident when the Masters of Paris turn to the symptoms and diagnosis of the disease. Observation is completely evaded. If we wish to know something of the actual manifestations of the plague, then we must learn not from the doctors of physic, but from poets, monks and painters whose wits were unclogged

by theoretical preconceptions. One tiny gleam of light penetrates the obscurantism of the *Consultatio* : vinegar is advocated as a powerful antiseptic. Why ? Not because " *sicut dixit Avicenna,*" but for the amazing reason—Experience tells us that it is of wonderful use ! In spite of this sign of a dawning intelligence, the hand of dead and gone systematists continued to control official medical teaching for many a long day ; none the less, the Black Death " brought home to great numbers of physicians that observation and empiric judgment is a legitimate method in dealing with medical problems."

W. P. MacArthur.

Allyn (Herman B.). **The Black Death. Its Social and Economic Results.**—*Ann. Med. History.* 1925. Vol. 7. pp. 226–236. [9 refs.]

This paper discusses the effects of the tremendous mortality from the Black Death on industry, customs and morals in England. After the pestilence there was such a shortage of labour that the villeins, hitherto bound to the soil, deserted their manors and demanded wages so high that sometimes the wage bill exceeded the price received for the harvest. Moreover, the cost of everything that the landowner had to buy increased by from 50 to 200 per cent. Attempts to control the economic upheaval by legislation failed to accomplish their object, and the bitter struggle between owners and tenants led gradually to a fundamental change in land tenure, so that leases took the place of labour services, and thus the old feudal system came to an end.

The author quotes Gasquet's estimate that 5,000 beneficed clergy died of plague, and that the total death-roll of the clerical order amounted to some 25,000. The vacancies were filled by young, inexperienced and often ill-educated clergy who exercised little restraining influence on the people, and so were ill fitted to combat the outburst of immorality and licentiousness which followed the pestilence. The failure of the new clergy to inspire confidence in their spiritual leadership resulted in a weakening of the Church's authority, and, though the point is not made in this paper, prepared the way for the ultimate Protestant revolt.

According to the author, the Black Death " contributed not a little " to the substitution of English for French as the national language of this country, but his argument is not convincing. He states that time and separation led to great corruption in the French in common use. As evidence of this he cites Chaucer's Prioress who spoke French :—

> " After the scole of Stratford attë Bowe,
> For Frenssh of Parys was to hire unknowe."

The tongue that the Prioress spoke " ful faire and fetisly " was no more corrupt French than Lowland Scots is corrupt English. The " scole of Stratford attë Bowe " was a Benedictine convent where, as in similar institutions, the old Norman-French idiom was retained, whereas " Frenssh of Parys " was the speech of what one may call the smart set. The lady's adherence to Norman-French was in keeping with her expressed distaste for Court fashions. As a matter of fact, English had been gaining ground at the expense of French for over 140 years before the Black Death ; at the time of the pestilence school-boys already had begun to construe their Latin into English instead of

French, and finally the national spirit aroused by Edward III's victorious wars—begun before the Black Death—led to the adoption of English as the language of the Court. English would have displaced French just as surely if never an Englishman had died of the bubo-plague.

The author " has no doubt " that the Black Death got its name from the petechiae, etc., shown by so many of its victims. It is not too much to ask for some evidence for this assertion. So far as the reviewer is aware, " *Pestis Atra* " is a mere variant of the more common *Mortalitas Magna*. *Ater*, he believes, was never used at this period to mean black-coloured, but only in the sense of " terrible," like the *Dies Atri* of the ancient Romans. " *Niger* " is the adjective employed in contemporary chronicles to describe the colour of the petechiae, not *Ater*. Up to the present the reviewer has failed to find any evidence that the name " The Black Death " was employed in England either at the time of the epidemic, or during the next 200 years. Even in Stow's 1603 edition of his *Survey*, the Black Death appears only as the " great pestilence in the time of Edward the third."

Although the author brings forward no new matter, and is content to take most of his material at second-hand, he has written an instructive paper for the general medical reader.

W. P. MacArthur.

Schadelbauer, Jr. (Karl). Die Sterzinger Pestordnung vom Jahre 1534. [**The Sterzing Plague Ordinance of 1534.**]—*Arch. f. Geschichte d. Med.* 1926. June 15. Vol. 18. No. 2. pp. 192–196.

Plague was rife in Europe during the fourth decade of the sixteenth century ; in London the epidemic of 1532 led to the first issue of the Bills of Mortality. Another outburst in 1535 postponed the opening of Parliament, and kept Henry VIII and Thomas Cromwell long from the capital. Venetia and Lombardy were ravaged in 1536, a bad plague year all over England also. The Tyrol was especially liable to epidemic invasion from its position as a highway of communication between Italy and Germany, and the district suffered severely from plague in 1534. In this year the authorities of the Tyrolese town of Sterzing enacted an " Ordinance during the mortal Duration (*sterbendn Leuffn*) of the Pest." The decree consists of a short preamble and fourteen arricles which the author of this paper transcribes in the wording and spelling of the original text. In the Ordinance, the Burgomaster and Council direct, under penalties, that a solemn procession of all the townsfolk and their households be undertaken devoutly and meekly, " the males walking apart and the females apart also," and when the noon bell rings each and all, young and old, shall kneel down and beseech Almighty God to turn aside the punishment of this grievous plague. Provision is made for the establishment of a Friary (brother-house) in a convenient spot, sick persons to be brought thither during the night or in the late evening or in the early morning so that terror may not be aroused. A specially appointed blood-letter (*Lassl**) will bleed and physic those who are needy and

* It is explained that the *Lassl* was the highest sanitary officer ; with him were associated the *Ordinatores*, the chief supervisory body and the *Zuettrager*, whose duties consisted principally in the supplying of food, drink, etc.

deserving of his care. Infected houses are to be quarantined, and the contacts isolated therein for 30 days reckoned from the last exposure to infection.

One or two persons are appointed to convey food to those so confined, and others to wait on the sick ; each Friday in the churches collections are to be made for the maintenance of the infected poor. No one recovered from plague shall go into the public bath (*vailpad*) within six weeks, be it woman or man, young or old, under heavy penalties. Innkeepers or other persons are forbidden to harbour wittingly any who come from cases which have ended fatally ; further, during this alarming visitation, on no account shall beggars be allowed to go from house to house. Since the loud jolting of the dead-carts has occasioned horror and dread in the past, henceforth a light cart fitted with a box (*Truchn*) and with muffled wheels, shall be employed ; the dead to be removed and buried late in the evening, at night or in the early morning and not when the people are going about the streets. No dead or sick cattle shall be left lying about or unburied in the neighbourhood of the town, whereby in the past the air has been corrupted.

It will be noticed that the Ordinance resembles generally the English Plague Orders of the period ; the quarantine of houses, isolation of contacts, provision for the sick poor and exclusion of strangers from infected localities, are all familiar. During one London epidemic a gibbet was " set up in the market-place of Windsor to hang all such as should come there from London." Some of the Scottish decrees were even more drastic ; the magistrates of Aberdeen directed the erection of three gallows in specified spots, " that in case ony infectit person arrive or repair by sea or land to this burgh, or in case ony indweller of this burgh receive, house or harbour, or give meat or drink to the infectit person or persons, the man be hangit and the woman drownit."

The English Orders, unlike that of Sterzing, recognize the agency of animals in conveying plague, and make provision for the destruction of cats and dogs. These animals were believed to spread the disease by carrying infection in their coats and hair. The English regulations regarding plague interments differed too, as at this period night burials were forbidden ; but during the next century, seemingly after the Great Plague of 1625, the procedure was reversed and plague burials were permitted only during the hours of darkness, until at the height of the plague of 1665 the brief summer nights proved too short to bury the enormous numbers that died daily.

In the above abstract of the Sterzing Ordinance the reviewer has given the substance of its more interesting provisions ; anyone wishing for further particulars concerning the decree should consult the original paper.

W. P. MacArthur.

LAGRANGE (E.). **Concerning the Discovery of the Plague Bacillus.**— *Jl. Trop. Med. & Hyg.* 1926. Sept. 1. Vol. 29. No. 17. pp. 299–303. With 3 text figs. [14 refs.]

The author was at Nha-Trang (Indo-China) as an assistant to Dr. YERSIN. " In June, 1894, KITASATO, then head of a Japanese Commission, and YERSIN, a French doctor, came to Hong Kong to study plague. Within an interval of a few days both claimed that

they had discovered the aetiological agent." The author describes the work done by these two men and shows how it came about that *B. pestis* became known as YERSIN's bacillus.

J. H. Tull Walsh.

HUME (Edgar Erskine). **Max von Pettenkofer's Theory of the Etiology of Cholera, Typhoid Fever and other Intestinal Diseases. A Review of his Arguments and Evidence.**—*Ann. Med. History.* 1925. Vol. 7. No. 4. pp. 319–353. With portrait & 5 other figs. [286 refs.]

Max PETTENKOFER was a Bavarian born at Lichtenheim on December 13th, 1818, one of a family of eight children. The boy's future was decided by his uncle, Dr. Franz X. PETTENKOFER, a chemist of note and court apothecary, who took Max into his home and became responsible for his education. Max completed his scholastic course with distinction in 1837 and entered the University of Munich, where he undertook the study of chemistry. He possessed imagination and an inclination for writing verses, sonnets, a collection of which was published forty-nine years later. Later he entered the Medical Faculty. He, however, preferred chemistry and while still a student wrote papers on the value of Marsh's test for arsenic and antimony. In 1843 he received the Degree of Doctor of Medicine and Surgery with a thesis on *Mikania Guaco* from which guacin is derived. He did not practice as a doctor, but confined his attention to chemistry in its relation to medical matters. He went to work under Josef SCHERER at Würzburg and carried out researches, demonstrating hippuric acid in the urine and the end product of the creatin of the muscles. The most important work was the discovery of " Pettenkofer's test for bile," useful to physiologist and physician. In 1844 Max was able to go to Giessen to study and work under LIEBIG, and there he would gladly have remained but for lack of funds. Forced to get some paid work he obtained a place in the royal mint on a very small salary. He also carried on his own work and showed that the saliva contained sulphocyanic acid. At the end of 1847 PETTENKOFER became professor of medical chemistry in the University of Munich, with a salary of 700 gulden in money, two measures of wheat and seven of rye, per annum. He lectured on chemistry in relation to diet, general physiology and sanitary hygiene, and in 1865 adopted the title " Lectures on Hygiene " for his course of instruction. Dr. Franz PETTENKOFER died in the year 1850 and Max PETTENKOFER was appointed court apothecary. In 1853 he was appointed ordinary professor of medical chemistry in Munich, and in 1855 was given a suite of rooms in the new Physiological Institute where he continued his good work on all the subjects connected with Hygiene. He published many papers. In 1865 PETTENKOFER and VOIT founded the *Zeitschrift für Biologie* in which PETTENKOFER'S works for the next eighteen years are collected. In 1872 Max von PETTENKOFER was ennobled and invited to go to Vienna as professor of Hygiene ; but he consented to remain in Munich where the Bavarian Government agreed to build a " Hygienic Institute " similar to the one in Vienna. This institute was opened in 1878 and students from all countries came to study under von PETTENKOFER who, during ensuing years, did great work and received several medals and honours. His life ended February 10th, 1901.

We now turn to Max von PETTENKOFER'S theories of the etiology of cholera and other intestinal diseases which at that time were new. Briefly stated an epidemic of cholera was due to : (1) A specific germ ; (2) certain local conditions ; (3) certain seasonal conditions ; (4) certain individual conditions. His own investigations were concerned chiefly with the second and third of the above conditions and when in 1883 KOCH demonstrated the "comma bacillus" PETTENKOFER at once accepted the work as confirming the first condition of his theory. A full Bibliography of publications by PETTENKOFER is given at the end of Major Hume's interesting Biography.

J. H. T. W.

STOCKMAN (Ralph). **James Lind and Scurvy.**—*Edinburgh Med. Jl.* 1926. June. Vol. 33. No. 6. pp. 329–350. With 1 plate. [20 refs.]

The author has gathered together almost all the available information regarding the history and work of Dr. James LIND who, though comparatively little known, achieved much, but the value of his work was not fully recognized during his life. He, however, is honoured in the Navy, for the welfare of which he laboured so continuously. In his fight against scurvy, as the author states, the mere fact that he almost eradicated the disease made his work soon forgotten, for scurvy ceased to become a crying evil, medical interest passed, and LIND was forgotten.

He was an original and independent worker, testing everything by experiment or by careful deduction from soundly ascertained facts, but he had not the "suaviter in modo" that brought such success to the second great Naval hygienist, Sir Gilbert BLANE, by whom most of LIND'S recommendations were put in force. A curious sentence of LIND'S is quoted which explains much : "The Province has been mine to deliver Precepts, the Power is in others to execute them." It must be understood that hygienic conditions in the Navy in LIND'S time were deplorable, and the evolution of better and healthier conditions for all those that went down to the sea in ships was woefully slow. The seamen had then few powerful friends and were, as now, badly in need of more.

The author describes an interesting "dark age" in the treatment of scurvy which was due to the much lauded "De Morbo Scorbuto Libor" by a Dutchman, Severinus ENGALENUS, 1588. This book which was apparently a tissue of falsehoods exerted a widespread influence and changed the whole medical conception of scurvy, so easy was it to influence the medical world then as now. In the early part of that century the disease was fairly well known and rightly treated, being not uncommon in general practice both afloat and on shore. In 1817, WOODALL, in "The Surgeon's Mate," advised the use of the juice of lemons both for cure and prevention, but it was LIND'S "Treatise on the Scurvy," 1753, and his subsequent works which definitely placed prevention and cure upon a scientific basis. LIND also showed how to provide pure water by distillation in ships, and gave good advice regarding the prevention of malaria and the general hygiene of ships. There is much more of interest in this history which is well told and to which useful references are given.

P. W. Bassett-Smith.

VAN DORSSEN (J. H. M.). De koortsepidemie te Cheribon in 1805. [**The Epidemic of Fever at Cheribon (Java) in 1805.**]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1926. Vol. 66. No. 4. pp. 461–501. With 1 plan. [Refs. in footnotes.]

Van Dorssen publishes a full account of the report on this epidemic, delivered by Isaäc DOUGLAS, chief surgeon in the service of the East Indian Company. The report is rather prolix, especially in the introductory part dealing with supposed telluric and cosmic influences on the health conditions at Cheribon in general.

The fatal epidemic of 1805 lasted from July till December, but made a number of victims in the beginning of 1806. It is estimated that approximately three-quarters of the population of Cheribon died from the disease, which, probably rightly, is considered by van Dorssen to have been a malignant form of subtertian malaria, though many cases of typhoid fever and dysentery may have occurred at the same time. DOUGLAS'S description is not very clear, for which fact the varying symptomatology of subtertian fever may account; he does not report upon the condition of the spleen. No beneficial action was seen of cinchona bark, the dosage of which, however, is not reported and may have been insufficient for the purpose.

The epidemic occurred during a very hot dry season, which followed an unusually long rainy one. It had a very local character and was not spread in the vicinity by patients who had fled from the afflicted town. A short time passed at Cheribon was sufficient to acquire the disease. The incubation period of one or two days, noted in such cases, if well established, justifies some doubt as to the malarial character of these cases and perhaps of the whole epidemic. Some remembrance existed among the population of similar epidemics in the past, but DOUGLAS'S assumption that such occurred synchroneously with vulcanic eruptions is wrong, according to information from other sources.

The report gives a vivid impression of the unhygienic conditions existing in a tropical town about one century ago, and of the dreadful state into which such a town was brought by an epidemic.

W. J. Bais.

HONIG (P. J. J.) & SWELLENGREBEL (N. H. H.). Bijdrage tot de geschiedenis der malaria in Nederland, tweede mededeeling: een onderzoek naar de gegevens, waarvan men zich bedient ter herkenning van de door plasmodiën veroorzaakte koorts in de geschiedkundige overlevering. [**Contribution to the History of Malaria in Holland. Second Communication: An Investigation into the Value of the Data usually applied for the Recognition in Historical Accounts of Fever caused by Plasmodia.**]—*Nederl. Tijdschr. v. Geneesk.* 1926. Sept. 4. 70th Year. 2nd Half. No. 10. pp. 1104–1120. With 3 maps in text. [Refs. in footnotes.]

Epidemic fevers, sometimes causing a considerable mortality, and known as "autumnal," "bilious," or "marsh" fever, are well known in medical history. The description of such epidemics is, however, often vague and does not allow the current identification of those fevers with what is at present understood by malaria, i.e., fever caused by plasmodia. Identification was believed to be justified if the fever:

(1) Was of an intermittent type ; (2) could be cured in a short time by means of cinchona bark or quinine ; (3) caused a considerable enlargement of the spleen, especially after repeated relapses ; (4) was inclined to relapse ; (5) was apt to occur in special seasons of the year ; (6) in its malignant type caused a high mortality of children ; (7) was more malignant to foreigners than to the inhabitants of the endemic region ; (8) was non-contagious ; (9) more common in the country than in the towns ; (10) occurred in the vicinity of swamps ; (11) could be combated by measures, suitable, according to our modern views, to eradicate the causes of malaria.

The authors produce a wealth of evidence from which it follows that the terms used by our predecessors often will not fit into the frame of our modern terminology and that many of their assertions may have been influenced by theoretical postulates or prejudices. The identification of those historical epidemics with malaria is only to be allowed if : (1) a closer description of the type of fever reasonably indicates that this was malaria ; (2) the action of quinine was a quick and striking one ; (3) the higher susceptibility of foreigners in the endemic regions and the high children's mortality cannot be ascribed to other causes (unhygienic circumstances of occupation troops, etc.) ; (4) the occurrence of the fever near swamps and pools cannot be explained otherwise and is not in contradiction with our present knowledge of the epidemiology of malaria ; (5) the results of seemingly modern measures are in real accordance with the same. The occurrence of relapses and the non-contagiosity of the fever are of no importance in this respect. The " malarial diseases " of the nineteenth century constitute an even less circumscript class of diseases than the " intermittent fevers " of previous centuries.

W. J. Bais.

Marchoux (E.). Le paludisme dans les Dombes et en Camargue. [**Malaria in Les Dombes and in Camargue.**]—*Bull. Acad. Méd.* 1927. Jan. 11. Year 91. 3rd Ser. Vol. 97. No. 2. pp. 67–89. [2 refs.]

The author describes and compares in physiographic, historic, and economic detail two rural tracts, situated about 2¼ degrees of latitude apart in the basin of the Rhone, both having a history of malaria, and both being prolific in *Anopheles maculipennis* at the present time, though malaria is now endemic in only one of them—having become merely a memory in the other.

The region where malaria is now only a tradition (though its embers may occasionally spark in an isolated case) is Les Dombes in the basin of the Upper Rhone. The author describes a rich alluvial plain liable to periodic flooding by that impetuous river. From early historic times the floods were brought and kept in control in a great system of specially constructed ponds, around which ancient rights had consolidated—rights of pasture, of watering stock, of retting flax, of culture of periodically drained ponds—rights all heritable and marketable. Under the *ancien régime* 99 per cent. of the ponds belonged to the clergy and noblesse and by them were let to miserable, badly-housed farmers, who, when their rents had been exacted, had barely enough to live upon and nothing left for increase and improvements. As for the peasants, ill-fed and scantily clad they went forth to their labour at dawn until after night-fall, when they lay them down with the cattle. What

the physical condition of this overworked and underfed peasantry must have been, and what the ravages of malaria, seems to have found first expression in the time of the French Revolution, when several communes of Les Dombes prayed in piteous terms for the abolition of the pestilential ponds : " where the ponds are, there the burials outnumber the births . . . . It is sad not to find one sexagenarian in a parish." What the welter of Anopheles must have been in those old days can be imagined from the statement that even to-day, when the area of pond-water is little more than half what it was, their larvae abound in every pond and the adults are to be seen " par millions " in byres, stables, piggeries, and poultry-sheds. So forlorn was Les Dombes that it was without any properly-made road for exporting its produce. So much for Les Dombes under the *ancien regime* : what the author chiefly emphasizes is a peasantry grievously overworked and underfed, and, among conditions interdictive of any economic improvement, the want of proper roads to markets.

To consider next the changes that occurred in Les Dombes in the course of the 19th century. The author gives some details of the rash orders passed by the National Convention for the immediate drainage of all the ponds. Much drainage was gradually done, so that between the beginning of the century and the year 1870 the area of pond-waters had been reduced by more than half (to 8458 hectares, from 20,000 hectares). Of the greatest importance, both for drainage and for economic progress, was the construction of the railroad from Bourg to Lyons, which ran right through the insalubrious district. Still, however, little effect was seen in the incidence of malaria ; still in many communes the number of deaths exceeded the number of births : in 1837 and 1857 the ravages of malaria were of peculiar severity. No great improvement indeed was observed until after 1863. It was then that malaria began to diminish, and " it was between 1880 and 1890 that intermittent fever finished by disappearing," although several thousands of hectares of pond were still intact and Anopheles still abounded.

Before that time, however, methods of farming and cropping under a new regime had improved immensely and there was also much increase of cattle ; moreover there was a main line of railway to carry good harvests and fat stock to large markets. As a result the condition of the peasantry was vastly improved ; they were no longer overworked and underfed and oppressed by care ; their minds were easy and their outlook on life enlarged—and this is a point that the author emphasizes.

The story of Les Dombes, however, is not complete. The extensive obliteration of ponds had not been effected without groans from the owners. For the waters bring forth abundantly the moving thing which hath life, and a hectare of pond brings forth annually 100 to 150 kilogrammes of fish worth 500 to 750 fr. ; moreover the dead and dried life accumulated in the bed of a drained pond is manure of unsurpassed richness when the drained bed is cultivated—and all this profit accrues naturally, without cost and with little care. A pond, in fact, is capital too valuable to be destroyed lightly. In 1901 the argument that in the draining of ponds one of the main sources of the communal wealth was also being drained received serious attention, and in that year laws were passed authorizing the refilling of ponds that had been emptied, provided that all such restored ponds be kept in good order and be periodically (every third year) drained again for a season for temporary return to the plough. Under this law 2,800 hectares of drained pond have been revived. Such is Les Dombes under a new

regime freed from malaria : although nearly one-seventh of the formerly insalubrious area is still composed of ponds prolific of *Anopheles maculipennis* the increased opulence of the soil and pastures finds full employment, under easy conditions, for a well-nourished and healthy population. But before discussing the causes by which the deliverance from malaria has been brought about, the author presents for comparison another region, also liable to inundation from the Rhone, where malaria persists.

The region is La Camargue, an alluvial island in the delta of the river at the sea face. The physical features of such an island are familiar to everyone. The area of the island is 75,000 hectares, of which only 16,000 are cultivated, notwithstanding the natural richness of much of the soil. This neglect is not due to lack of labour, but is attributed to absentee-landlordism. Such cultivation as there is, is little varied—rice, barley, and lucerne in alternating succession, and the vine. The pastures, however, are not neglected, and one sees large flocks of sheep—besides cattle and horses in a semi-feral state. Labour is recruited from various parts of southern and western Europe, and the recruit is paid a lump sum (à forfat). The individual labourer therefore has to adapt anything he can get as a lodging and it is nobody's interest to see how he is fed. The agents of the landlords, however, have good houses, gauze-protected. *Anopheles maculipennis*, though not nearly so abundant as in Les Dombes, is not difficult to find in stables, piggeries, etc., and is sometimes seen in human habitations. Medical testimony is not entirely unanimous in respect of malaria and the absentee landlords say that it does not exist. But the author himself examined 6 cases in one day and found *P. vivax* in the blood of 3 of them; and of at least 9 local doctors questioned by him at least 8 testified to the existence of malaria, and one of them had treated a small epidemic of 128 cases in 1922. A good proof of the existence of malaria is the fact that visiting strangers contract the disease. Such is La Camargue —and the points upon which the author lays stress are the miserable lodging and bad food of the labourer and the neglect of agriculture.

In his final summary, contrasting Les Dombes and La Camargue as they are to-day, and bearing in mind the condition of Les Dombes in former times, the author admits that the explanation of the arrest of malarial fever in Les Dombes is not " univocal."

He does not think that it is due to better housing, since although the agricultural labourers in La Camargue are housed anyhow, the habitations in Les Dombes are old and inconvenient and men may still be found sleeping in stables there.

He does not appear to think that mere indiscriminate drainage has been a panacea in this instance, since he insists that the ponds, properly managed, are one of the principal sources of present prosperity.

It is on this change from misery to prosperity that he concentrates his argument. What with fish-ponds easily managed, what with the fertilizing value of the deposit of emptied ponds, what with enriched pasture for stock,—what with all this spontaneous gift of Nature, and with easy access to markets, labour is light. The peasantry is now in easy circumstances and lives well –and " it is to general well-being (bien-ètre) that the disappearance of paludism in Les Dombes is due," as the result of increased natural resistance to infection.

[If, as must be allowed, bien-ètre has psychical as well as physical aspects, natural resistance must include in its scope all those influences upon the body that emanate from a hopeful spirit and a mind at peace

It may therefore be relevant (as a pendant to this interesting account of Les Dombes) to remind the reader that the earliest historical record of malarial fever in England relates to the influence of the mind upon the manifestations of ague. The record occurs in the 12th chapter of the 3rd book of Bede's "Ecclesiastical History of the English Nation." It tells that some time in the year A.D. 642, a certain little boy in the monastery of the Northumbrian Saint Oswald had long been troubled with ague. "He was one day anxiously expecting the hour that his fit was to come on, when one of the brothers, coming to him, said, 'Shall I tell you, child, how you may be cured of this distemper? Rise, go into the Church, and get close to St. Oswald's tomb; stay there quiet, and do not leave it; do not come away, or stir from the place, till the time that your fit is to go off: then I will go in and fetch you away.' The boy did as he was advised, and the disease durst not affect him as he sat by the Saint's tomb; but fled so absolutely that he felt it no more . . . ever after."]

A. Alcock.

MÜLLER (Reiner). Die Sagalla- und die Kabartukrankheit der Keilschriften, *Filaria medinensis* und *Mycetoma pedis*. [**The Sagalla and Kabartu Diseases of the Cuneiform Scripts are Dracunculosis and Mycetoma pedis.**]—*Arch. f. Geschichte d. Med.* 1926. Vol. 18. No. 2. pp. 189–192.

The author maintains that descriptions of diseases on Assyrian tablets 2,600 years old, refer to mycetoma pedis and guineaworm. The earliest indication in the literature of tropical medicine to Madura foot is attributed by von RÖMER to Wouter SCHOUTEN who visited the Malabar coast and in his book "Oost-Indische Voyagie" (1676) mentions "Sankt Thomasbein," but the author thinks that his description may equally well refer to elephantiasis. In 1921–23 Erich EBELING published Cuneiform Texts of Medical Interest. Kabartu disease which is there mentioned 19 times the author considers it to be Mycetoma pedis since all the symptoms fit and none are against this diagnosis. EBELING suggests that Kabartu is the same as Sagalla which is mentioned on other tablets 17 times, but Müller cannot agree. Swellings are named in connexion with Sagalla rarely, in Kabartu very frequently: this affects almost exclusively the foot, that various parts of the body. Sagalla is treated by conjurations to drive something evil from the system: in Kabartu these are not found. Sagalla means literally "the big sinew" and suggests the tendon-like *Filaria medinensis*. Extracts from the description [literally translated from the German] are as follows: "The half of the venom it has taken from the snake . . . it has no mouth . . . it draws near like the morning, not recognized in the flesh . . . it has neither face nor gate, it attacks suddenly knee, leg, ankle . . . may it be dissolved, driven away, bound . . . may it emerge below . . . may the (female) bruiser (Zermalmerin) leave thy body." The author admits the vagueness of some of these characters but thinks they fit the guineaworm. The warriors returning from Egypt might easily have brought this infestation if it did not already exist in the intermediary host in the pools of Assyria.

On the Kabartu tablets 19 sentences begin "If a man is ill with Kabartu disease, then thou must. . . . " there follow various remedies, such as serve for binding up or sprinkling, poultices, frictions, etc.; applications to ulcers and fistulas. A number of these pronouncements

are given, from which conclusions may be reached about the disease. Thus one shows it to affect the foot which is discoloured; in another, the heel and swelling of the foot are mentioned; in another Ton or clay is mentioned and the desirability of getting it out of the foot; the author suggests this to be the viscid, oily excretion. In another place the condition is spoken of as black, in allusion perhaps either to gangrene or the black granules.

The author observes that mycetoma is now recognized in most tropical and sub-tropical lands, as well as in southern Europe and America, but in Mesopotamia does not appear to be common. However, it may well have been otherwise 2,600 years ago, for there was another population with other customs and other methods of tillage.

A. G. B.

MacArthur (W.P.). **Some Notes on Old-Time Leprosy: the Case of King Robert the Bruce.**—*Jl. Roy. Army Med. Corps.* 1926. May. Vol. 46. No. 5. pp. 321–330. [Refs. in footnotes.]

As Naaman of old in the fountains of Jordan, so now in the Hippocrene waters of the Muse of History is King Robert Bruce cleansed of his leprosy. Going back to this original source and avoiding all the snares of transcribers, the author discovers three Scottish writers who, having had "ample opportunity for collecting accurate information regarding Robert Bruce from his comrades and others who had lived and served with him" are to be regarded as "historical authorities for this [Bruce's] period," and two contemporary English chronicles, valuable enough in their own sphere, but compiled if not in anti-Scottish prejudice at any rate not from sources of intimate familiarity with the Scottish court. These are the five original documents that provide the evidence upon which the author would, to begin with, consider the truth of the statement that Bruce was a leper. (The author also brings Froissart into his court, not as a contemporary witness, since Froissart did not appear in Scotland until 30 years after Bruce had been inurn'd in his sepulchre; but out of esteem and an obvious sympathy with that time-honoured old Chronicle.)

The three contemporary Scottish authorities in their reference to Bruce's fatal illness make no mention of leprosy: one of them, John Barbour, states that it began in a "founder"; another, Andrew of Wintoun, says that Bruce "lay in lang sickness"; and the third, John of Fordun, does not specify any disease.

The two contemporary English chronicles are the *Chronicon de Lanercost*, attributed to a Franciscan monk of Carlisle, and the *Chronicon* of Walter de Hemingborough, a cleric of Gisborough in Yorkshire. The first of these—the only one that the author seems to think worthy of serious attention—states that Bruce deputed to another leader the command of a particular border-raid (the Weardale campaign that was carried out about two years before his death) because he had become leprous, and that he died a leper.

In weighing this historical evidence the author accepts that of the Scottish chroniclers (whom he assumes to be free from bias), as coming with very little indirection from Bruce's intimates. The English chronicler of Carlisle, however, can be proved to be wrong in one particular, since it has been shown from State Records that Bruce was absent from the Weardale campaign because he was then actively engaged in Ireland in an attempt to stir up there a diversion against England; so that, quite apart from any assumption of anti-Scottish bias, his evidence as a historian is suspect.

The author next brings forward much circumstantial evidence against the assertions of the English chronicler. He points out that within 18 months of his death Bruce carried out a highly successful raid far into Northumberland and Durham—an achievement hardly possible for a man far gone in

leprosy ; also that in the year before his death he crowned his four-year-old son David and his six-year-old daughter-in-law with his own hands—an act which, performed by a " leper—spreading infection, as was believed, by his breath and touch—would have been an infamous outrage in the 14th century."

Furthermore he notes [for what it is worth] a statement made by the said son David about a certain younger brother—a statement implying that Bruce must have had a son born to him at a time when leprosy (if existent) would have been too far advanced to allow fertility.

With formidable pertinacity the author continues the circumstantial argument to show that if Bruce had really been a leper, or had even any blemish on him that could be miscalled leprosy, we should not now have to search the chronicles of wasted time for any knowledge of the matter. For Bruce, for the last 23 years of his not very long life had endured an almost inconceivable torrent of sacerdotal malediction, and all men must have been watching for a sign. Not only had he been excommunicated to the utmost limit for the murder of Comyn, and again for refusing the intermediation of the Pope for a truce with England, but every additional sort of imprecation had been invoked against him for his impious contumacy towards the spiritual head of Christendom. For he had ignored and even refused acceptance of Papal bulls ; he had insulted and even permitted outrage of the papal legate ; and had defied the summons of the exasperated Pope himself. Horrified execrations had been showered on him by the hierocracy. The best words for him in his enemies' wame were " perjurer," " felon," " murderer " ; with what sanctimonious triumph, therefore, would they have noised abroad Heaven's heavy judgment of leprosy upon such a sacrilegious rebel and have filled their mouths with the odious epithet " leper," had he been afflicted with a cutaneous disease of any sort.

It would appear, then, from the argument here briefly outlined, that the statement that Bruce was a leper depends entirely on the word of an individual of what Carlyle calls " that most singular extinct species of two-legged animal," the mediaeval monk ; the unknown voice—*vox et praeterea nihil*—crying out in Cumberland, finding echo in Yorkshire, and afterwards during 600 years being repeated from time to time by Carlyle's goose-goddess, " Mortuus est . . . Robertus de Brus . . . leprosus."

A. A.

CELLI (Angelo). Storia della Malaria nell' Agro Romano. [**The History of Malaria in the Roman Campagna.**]—*Mem. R. Accad. Lincei*, Rome.

A review of this work appears on p. 411.

AMOEBIASIS AND DYSENTERY

Amoebiasis.

Craig (Charles F.). **The Symptomatology of Infection with *Endameba histolytica* in Carriers.**—*Jl. Amer. Med. Assoc.* 1927. Jan. 1. Vol. 88. No. 1. pp. 19–21. [6 refs.]

Since it is known that most of the infections with *E. histolytica* result from contact with carriers, their detection and treatment is of great importance. It is certain that a large proportion can be cured; and all will be improved in health by proper treatment. The author therefore urges strongly the desirability of a routine microscopic examination of the faeces [his own work and that of J. H. St. John induces one to add—and by culture] in all patients presenting the symptoms noted in this paper, which are largely confined to the digestive and nervous systems and elicited only by close questioning and survey of the clinical history of past months or years:—(1) constipation relieved more or less by occasional diarrhoea, (2) distaste for food, anorexia, loss of weight, (3) evanescent pains in right iliac region, (4) a mild degree of anaemia, (5) neurasthenia (protean symptoms), (6) subnormal temperature.

The author deplores the fact that the mental picture of amoebic infection is usually coloured by the symptoms of amoebic dysentery, whereas in fact dysentery is noted in only a minority of cases infected with *E. histolytica*. Many carriers of *E. histolytica* have macroscopic ulcers in the large intestine which have not produced dysenteric symptoms. It may be that there are healthy carriers of this parasite; certainly 50 per cent. of carriers can be shown to be injured physically by the amoeba. It is unfortunate that for most medical men "amoebic dysentery" should have become a synonym of "amoebiasis" or "amoebic infection."

H. M. Hanschell.

Craig (Charles F.) & St. John (J. H.). **The Value of Cultural Methods in Surveys for Parasitic Amebae of Man.**—*Amer. Jl. Trop. Med.* 1927. Jan. Vol. 7. No. 1. pp. 39–48. [6 refs.]

The results of this survey of 71 individuals, carried out with high technical skill, have an immediate practical importance.

(1) It demonstrates that cultural methods are superior for diagnostic purposes to either sedimentation methods or the direct examination of faeces when only one microscopical preparation is examined.

(2) Cultural methods showed that 39 of the 71 persons harboured one or more species of amoebae. *E. histolytica* in 11; *E. coli* in 21; *E. nana* in 9; and *Iodamoeba williamsi* in 4. In 8 persons *E. histolytica* occurred alone; in 5 *E. nana* alone; in 16 *E. coli* alone; and in 2 *I. williamsi* alone. In 8 more than one species was present.

(3) Locke-serum medium gave a larger percentage of positive results than did any of the other methods employed, and neither coagulated egg nor a solid substratum of any kind is necessary for success in surveys for intestinal amoebae.

(4) Successful results with medium composed of 7 parts normal salt solution and 1 part inactivated human blood serum demonstrate that none of the chemicals in either Locke's or Ringer's solution, with

exception of NaCl, were essential in the media used in the survey and that the continued cultivation of *E. histolytica* for indefinite period is possible in this simple medium, as shown previously by Craig.

H. M. H.

Johns (F. M.). **Determination of Relapse in Amebic Infections.**—*Southern Med. Jl.* 1927. Feb. Vol. 20. No. 2. pp. 96–98. [6 refs.]

The author has engaged in an intensive study of treatment of amoebic dysentery and eradication of cysts in carriers. Impressions gained from study of the entire series of cases after following many patients for many months are as follows:—By amoebic infection is meant active reproduction of *E. dysenteriae* within the body, particularly in submucosa of large intestine or in abscess cavities within liver. Treatment of this condition with ipecac. or its derivatives, with stovarsol or yatren, quickly reduces actual numbers of amoebae present; visible lesions in rectum and sigmoid apparently heal; multiple small liver abscesses (so called acute amoebic hepatitis) subside, and the patient becomes clinically well. Experience both as laboratory observer and therapeutist shows that most patients suffer a relapse. In the quiescent period following complete clinical cure it is not possible by any present means to be sure of cure even though amoebae are not found in faeces or rectal scrapings. Clinically relapse may occur by renewed open ulceration in caecum, sigmoid or rectum, or by abscess formation in liver. The greatest number of early relapses were signalized by finding encysted amoebae in an apparently normal stool, with patient complaining of vague right-sided abdominal discomfort. In one patient, who relapsed in sixth month, was found in rectum an ulcer the size of a silver dollar, 10 days after proctoscopy had failed to demonstrate any lesion. It is clear the lesion had progressed in the submucosa and suddenly the surface covering sloughed off. Proctoscopy will often reveal small ulcers attending a slight clinical disturbance, and in scrapings from these the amoebae will be found. The author has never found cysts in the lesions of rectum or in the bloody mucoid material adhering to walls of gut. In 3 cases clinical relapse began as liver abscess. He has been unable to confirm Kofoid's so-called "excretion" of encysted amoebae from amoebic liver abscess by examination of duodenal contents; and does not believe that at the present time amoebiasis should be diagnosed on phantom forms the size of yeast cells obtained by duodenal drainage. Even though there are no symptoms, faeces should be examined for amoebic cysts at monthly intervals, for at least 12 months after apparent cure. Culture methods may develop a means of still earlier detection of infection and relapse.

H. M. H.

Trabaud. Considérations sur quelques manifestations cliniques peu connues de l'amibiase humaine. [**Some Little-known Manifestations of Amoebiasis.**]—*Rev. Méd. et. Hyg. Trop.* 1926. July–Aug. Vol. 18. No. 4. pp. 97–104. [4 refs.]

In Syria amoebiasis is endemic and widespread. Chronic amoebic infections are as common as acute, and since in most cases of chronic infection diarrhoea is absent or is inconstant, it is in general medical work that the chronic infections are often met with. These chronic

amoebic infections give rise to—(1) a typical dysentery manifestation, such as mucous stools, perhaps tinged with blood, in patients admitted to hospital for other ailments, (2) 'colitis'—often with obstinate constipation,; (3) gastro-intestinal dyspepsia; (4) amoebic septicaemia —manifested as irregular fever, and prostration—sometimes typhoid-like illness, anaemia, enlarged spleen and liver, rose or purpuric spots; yet another type of amoebicaemia gives rise mainly to pulmonary symptoms; (5) pseudo-surgical syndrome—amoebic cholecystitis and pseudo-appendicular symptoms—there is a true amoebic appendicitis however; (6) a symptom complex closely resembling Banti's disease. In this *E. histolytica* is found not only in the stool, but also in the fluid removed by duodenal tube. It is cured by anti-amoebic treatment.

H. M. H.

Choy (Paul Dong). **Preliminary Report on Latent Amoebiasis of Koreans, and the Result of Yatren Treatment.**—*Far Eastern Assoc. Trop. Med. Trans. Sixth Biennial Congress, Tokyo, 1925.* Vol. 2. pp. 79–95. With 6 charts in text.

Part I. A careful investigation among 2,335 individuals of the incidence of *E. histolytica* infection among different classes of Koreans not suffering from clinical dysentery. The results are set out in tabular form. Some may be given:—

E. histolytica was found in 29 per cent. of students; 31 per cent. of nurses; 31 per cent. farmers; and 39 per cent. factory workers. Among hospital cases, in age group 1 to 10 years, 46 per cent. harboured *E. histolytica*; 41 years and over, 84 per cent. (27 cases). This last group also showed highest incidence of infection with all kinds of protozoa. (Dobell and Kessel have pointed out that ratio of protozoal infection increases with age.)

Sexes. Infection in females—34 per cent.; in males 25 per cent., the difference being probably due to occupational differences. Taking all ages, classes, and both sexes together, 61 per cent. were found infected with some kind of protozoan infection; 30 per cent. harboured *E. histolytica.*

Geographical distribution: *E. histolytica* found in 30 per cent. in North Korea; in 29·3 per cent. in Central Korea; in 50 per cent. in South Korea; but in this last only 12 cases examined.

Part II. *Yatren treatment,* tried in 29 cases, in 15 of which follow-up examinations were made. It proved effective in ridding patients of not only *E. histolytica,* but other amoebae as well. Trichomonas (2 cases) was unaffected by it. Yatren is superior to emetine as a remedy in 'latent' and chronic cases of *E. histolytica* dysentery. Emetine is better in acute cases; for yatren is apt to produce profuse diarrhoea and colicky pains.

H. M. H.

Reichenow (Eduard). Zur Frage des Sitzes von *Entamoeba histolytica* im Darm. [**The Seat of** *E. histolytica* **in the Gut.**] *Arb. a. d. Reichsgsndhtsamt.* 1926. Vol. 57. pp. 136–146. With 2 text figs. [18 refs.]

In this paper the author discusses at length, with many references to the work of a number of other investigators, whether *E. histolytica*

is chiefly a tissue parasite or, like the other amoebae of man's gut, lives mainly in the lumen of the intestines. [The reader gains the impression that Dr. Reichenow's view is that the evidence at hand supports the second rather than the first alternative.] The main lines of his discussion of the matter are :—

There are the two forms of *E. histolytica* : (1) A large one, with clearly demarcated ecto- and endo- plasm, the latter granular, slightly vacuolated and often containing erythrocytes or cell remnants, the *histolytica*, or tissue-invading type ; and (2) a small much vacuolated form with indistinct differentiation of ectoplasm, and containing no cell-remnants—the *minuta* type. It is held that *histolytica* type lives and feeds only in the tissues, appears in the gut lumen only to encyst, and there its precystic form is the *minuta* type. There are very many carriers of *E. histolytica* without dysentery : this may suggest that *E. histolytica* is a harmless commensal of the gut lumen rather than an obligatory tissue parasite : but it is claimed that in most of these cases tissue regeneration of lesions caused by the parasite is so rapid that no symptoms result, and in general there ensues mutual adjustment between host and parasite. It is counter-claimed that these carriers do present symptoms of various sorts—e.g., constipation, diarrhoea, neurasthenia ; this claim is weakened by the fact that these symptoms are also laid to the charge of flagellates and amoebae that are unquestionably found only in the gut lumen. (Brumpt (1925) has described *E. dispar* as usually mistaken for *E. histolytica*, with which it is morphologically identical except that *dispar* develops no large tissue-invading haematophagous forms ; as non-pathogenic in man, living only in gut lumen ; as non-pathogenic for kittens, yet sometimes found, even containing erythrocytes, in the kitten's gut wall !) It is improbable that there are different races of *E. histolytica* with different pathogenicities, for by experiment the same race has produced dysentery in one human subject and infected another without causing any sign of dysentery. This gives no support to the view that *minuta* type is a non-pathogenic race of *E. histolytica*, living only in gut lumen and on bacteria. In the gut of both kitten and man ulceration caused by *E. histolytica* may be so slight as to be undetected by naked eye. In contrast to what occurs in man, *E. histolytica* infection in the kitten is an acute, never a chronic, illness. This is understandable if in the kitten (contrary to what happens in man) *E. histolytica* cannot live in the gut lumen. (The author states that infection of the kitten with vegetative forms per clysma is successful more often than with cysts per os, because in the former the introduced catheter damages the gut mucosa and so favours penetration by the amoebae.) Rectoscopy of cases harbouring *E. histolytica*, and complaining not of dysentery, but of some illness more or less referable to the intestines, has revealed lesions of gut mucosa in practically all ; but a truer rectoscopic investigation would be one of an unselected mass of people infected with *E. histolytica*. Abscess of liver or other organ may occur in persons who have never had dysentery—in these the amoebae must have passed through the gut wall. Such abscesses are, however, very much commoner in dysentery cases and invasion of the gut wall by amoebae does not necessarily produce dysentery.

Coccidium is an undoubted tissue parasite. In man its pathogenicity depends directly on its numbers, for tissue regeneration rectifies too rapidly a small infection for symptoms to ensue. Comparing this with *E. histolytica* (the alleged tissue parasite) in man, Dr. Reichenow describes the case of a healthy man with enormous numbers of *E. histolytica* cysts in the stools—and asks—could such large numbers of amoebae feed on the host's tissues and produce no symptoms ? Again—in dysentery cases he has found a mild dose of Carlsbad salts followed by a marked decrease, lasting for at least one day, of number of amoebae in the stool. *E. histolytica* is thus affected *equally* with the non-tissue-invading amoeba species of man. This is not consistent with the view that *histolytica* is

exclusively a tissue parasite. The large (tissue) types of *E. histolytica* are not found in these stools after Carlsbad salts. If a *histolytica* carrier case in whose formed stools only cysts are found be given a purge, *minuta* forms can then be demonstrated, and they can be found in early subacute dysentery as well as in healthy carriers. This is understandable if *E. histolytica* can live in gut lumen, as well as in gut tissue. In a case (with history of former dysentery followed by diarrhoea), in which rectoscopy revealed normal gut mucosa, the author found actively motile *minuta* forms, with well marked pseudopodia. Measurements showed nearly all these active amoebae to be of the same size as the cysts (stained preparations usually show *minuta* forms as in the precystic stage only). If carriers without clinical signs of dysentery have *E. histolytica* in the gut wall, one would expect to find often large-type amoebae in their gut lumen. This does not happen. Again if *E. histolytica* is a tissue parasite, one should find in gut lumen immediate precystic forms only, but, in fact, active forms and those showing nuclear divisions can be found in the gut contents.

Most *minuta* forms in gut contents are free from formed food-material the author, however, has found *minuta* containing bacteria. In culture *E. histolytica* feeds on bacteria which are not its sole food, however, for it can also ingest soluble material; this last forms its chief nutriment in the tissues where only few of the *histolytica* found contain erythrocytes or cell remains. (*Minuta* type can also ingest soluble material.) If *E. histolytica* as well as *E. coli* is a parasite of the gut lumen, why should not the latter also invade the gut wall and become pathogenic? The answer is that *E. histolytica*, in contrast to the other intestinal amoebae of man, is not restricted for food to the bacteria of the gut lumen, but as it can equally ingest material in solution, it can live in the tissues also.

H. M. H.

Ludlow (A. I.). **Amebic Liver Abscess.**—*China Med. Jl.* 1926. Dec. Vol. 40. No. 12. pp. 1165–1189. With 14 figs. on 4 plates. [24 refs.]

The subject is very fully discussed, with references to the work of others, and on the basis of the author's own experience of 160 cases in Korea. The climate there is temperate. Amoebic dysentery is not rare among the white population in Korea, yet no case of liver abscess in them has been reported. Both, however, are common in Koreans. Of liver abscess 74 per cent. of cases occurred between ages 21 and 40 years. 11·2 per cent. occurred in Korean females—a much higher percentage than that recorded in other countries. Dr. Ludlow's records warrant stress being laid on use of alcohol as a predisposing cause of amoebic liver abscess. History of previous diarrhoea or dysentery was obtained in 90 per cent. of the patients. In three cases of liver abscess *E. councilmanii* was the only amoeba found in the faeces. Dr. Ludlow suggests the possibility of this amoeba being a cause of liver abscess, and that this may be proved when it shall become possible to distinguish between motile forms of *E. dysenteriae* and *E. councilmanii*, or to induce encystment of the motile form—perhaps in culture from liver pus. The abscess developed as a rule insidiously. Large abscesses were present with nearly normal pulse, temperature, respirations and blood count. Duration of illness (in 60 cases) ranged from 2 to 40 weeks—average 11·5 weeks. The large single abscess of right liver lobe predominated; average amount of pus in the last 60 patients was 1,109 cc. Deep seated pain in region of abscess elicited by sudden finger thrust is an important and practically constant sign. The "follow

up" mortality of 117 open operations was 11·1 per cent. and of 43 aspirations 2·3 per cent. Early and energetic treatment of amoebic dysentery with emetine is an efficient prophylactic for amoebic liver abscess. No case had developed in Korean or foreigner thus treated. Small liver abscesses can be cured by medicinal means. Even in such cases it is advisable to hasten recovery by aspiration. *Aspiration is the method of choice.* Open operation is not, however, attended with great mortality and is to be used for "selected" cases. Finally the physician must keep a mental attitude of suspicion as to possibility of liver abscess in localities where amoebic dysentery is prevalent and even in places where it is rarer.

H. M. H.

Trabaud. Le masque amibiasique. [**The Amoebiasis Mask.**]—*Rev. Méd. et Hyg. Trop.* 1926. Nov.–Dec. Vol. 18. No. 6. pp. 167–168.

A characteristic mask may become apparent when a large number of patients with the same disease are assembled together. Thus the malaria facies is easily noted among a group of chronic malaria patients in countries where malignant malaria is endemic. They present a "coloration speciale" of the skin, especially of the face, and the eyes are sunken, with bluish white sclerotics. A number of patients with chronic amoebic infection, observed all together, show a swarthy tint of face against which show up the white sclerotics in the hollow orbits. This is the amoebic facies seen in severe cases, and especially in cryptic forms of chronic amoebiasis. It is a grey pallor of face with a tawny swarthy tint of eyelids and skin around the orbits. The conjunctivae show anaemia. Once noted it indicates the necessity for careful search, by every method, for amoebae. This amoebic facies results from the circulation in the blood of a large quantity of the products of disintegration of red blood cells, which becomes fixed in the malpighian stratum, there absorbs solar rays and is transformed.

[It is noteworthy that the author has not noticed—at any rate does not mention—the slight icteric tint of skin and sclerae so often present in chronic malignant tertian malaria; perhaps this is included in "coloration speciale."]

H. M. H.

Kessel (John F.). **The Domestic Pig as a Probable Reservoir Host of the Dysentery Amoeba of Man.** (**Abstract**).—*Far Eastern Assoc. Trop. Med. Trans. Sixth Biennial Congress, Tokyo, 1925.* Vol. 2. pp. 77–78. [2 refs.]

Cameron (1924) has summarized the parasitic diseases of the domestic pig, but few protozoan parasites are recorded. [see this *Bulletin*, vol. 21, p. 901]. It has long been known that Balantidium and Iodamoeba are commonly found in the pig, and also the doubtful species of *Entamoeba, polecki* and *suis*. Recently the author examined the faeces of 100 pigs from Peking markets. He found cysts whose morphology corresponded with cysts of *E. coli, I. butschlii, Endolimax nana, Entamoeba dysenteriae* and *Chilomastix mesnili*, and in addition an active Trichomonas and a small form resembling Embadomonas. In 30 per cent. of these pigs he found cysts of amoebae which, unstained and stained, were microscopically indistinguishable from *E. dysenteriae* of man. (Transmission experiments

to establish further their identity are being undertaken.) The author suggests that the pig may be a reservoir host of the dysentery amoeba, as well as *Balantidium coli* and *minutum*, of man. And in the Orient the pig lives in close proximity to the human family.

H. M. H.

Mills (Lloyd). **Ocular Disease occurring in the Course of Nondysenteric Amebiasis.**—*Jl. Amer. Med. Assoc.* 1926. Oct. 9. Vol. 87. No. 15. pp. 1176–1182. [23 refs.]

(1). A large proportion of chronic cyclitis, episcleritis, primary and secondary glaucoma, choroiditis and conjunctivitis, unyielding to local treatment, are found associated with heavy intestinal infections of protozoa and flagellates of proved tissue-invasive capacity and nearly always with an accompanying chronic colitis.

(2). The sole addition of effective antiamoebic treatment to the local therapy has procured relief, arrest, or cure of the ocular condition—suggesting a direct or mediate relation between the ocular disease and the effects of the intestinal parasitism.

(3). The symptomatic relief which follows emetine therapy in some cases of " amebic iritis " is enough to suggest its application to iritis of other origin.

(4). The related periodicity of abdominal discomfort, with the exacerbations of chronic ocular disease, especially in iridocyclitis and secondary and primary glaucoma, suggests a hitherto unrecognized intestinal origin in many of these latter cases.

Of 88 patients studied, 16 (18 per cent.) had lost one eye on account of glaucoma. All 88 showed gross abdominal pathological changes with heavy infections of *E. dysenteriae*, with or without flagellates.

(5). Conjunctivitis, corneal ulcers, episcleritis and possibly some forms of keratitis more often occur in association with mixed infections in which Chilomastix, Trichomonas, Craigia and Giardia predominate.

(6). The insidious exudation accompanying " quiet iritis " of protozoan association develops into a dense tough membrane like the Jacksonian membrane about the caecum and colon believed by many to arise from protozoan activity. Formation of this membrane is often arrested by antiamoebic treatment, which should always be a preliminary to attempted iridectomy in these cases.

(7). In horses with " periodic ophthalmia " (a specific recurrent iritis in which no bacterial causation has been proved) protozoa have been found in their faeces.

H. M. H.

Young (W. A.). **An Interesting Case of Amoebic Dysentery and a Suggestion for Treatment.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1927. Jan. Vol. 20. Nos. 5 & 6. pp. 370–372. [4 refs.]

Daily microscopic examinations of stools of an amoebic dysentery case, both before and after emetine therapy, revealed a certain periodic decrease and increase of amoebae. The author suggests that the administration of more than one grain of emetine daily for 6 days has an inhibitive effect on production of the tissue-emetine-substance (T.E.S.) which kills *E. histolytica*. Better results would accrue by giving emetine

every 3 or 4 days after the first 6 grains—or, if microscope be available, better still by giving 1 gr. emetine 12 hours before multiplication of amoebae is due.

(1). Emetine is a very potent protoplasmic poison—its continued administration so damages cells of gut wall, or of body generally, that T.E.S. is not developed and amoebae are able to reproduce in spite of emetine.

(2). Certain amoebae may be in such sites that T.E.S. does not reach them. But when they reproduce, more tissue is utilized as food and thus their safe retreat should be broken up.

(3). If some amoebae can ward off effect of T.E.S. and survive, a race immune to emetine would be developed. [Dobell and Laidlaw experimenting with emetine on *histolytica* cultures, in vitro, could produce no emetine resistant strain of the amoeba.]

(4). Yorke and Adams (1925) have shown that amoebic cysts can be made to excyst easily in culture. It is possible, therefore, that the superficial amoebae on first contact with T.E.S. encyst; they later excyst and if at time of excystation no T.E.S. was being produced, reinfect gut wall. Since Yorke and Adams have shown that excystation requires neither gastric nor pancreatic juice, such an event in the large intestine does not seem impossible. Though Dobell and O'Connor have denied such a possibility Sellards and Theiler, [and Hoare], infected kittens intrarectally by injection of *E. histolytica* cysts. No. 1 above, seems the most probable happening and would explain the clinical findings in the case observed. Therefore, administer emetine until the acute symptoms cease or blood disappears from stool and find out periodicity of the amoebae and administer emetine twelve hours before the new crop is due.

H. M. H.

Bablet (J.), Mesnard & Stéfani. Note sur un cas d'abcès amibien du poumon gauche. [**A Case of Amoebic Abscess of Left Lung.**]—*Bull. Soc. Path. Exot.* 1926. Dec. 8. Vol. 19. No. 10. pp. 884–887.

The authors note that amoebic abscess of lung, hitherto considered a rarity, has latterly been more often recorded, most cases being at the base of the right lung and complicating hepatic abscess.

The case here described shows that amoebic abscess of the liver may migrate to the base of the left lung and there continue its development independently after cicatrization of the hepatic lesion. A soldier 35 years old, in Hanoi, suspected of, and treated for one year for tuberculosis, was found with remittent fever, tachycardia, and dyspnoea. Acute tenderness in left hypochondrium, splenic dullness not increased, liver enlarged and tender. Auscultation gave no definite signs of lung lesion. In the blood-stained sputa, Koch's bacillus was never found, nor were amoebae, spirochaetes, nor paragonimus. *Necropsy* revealed an abscess in the left lower lobe of lung. No solution of continuity of left diaphragm which was much thickened. The left lobe of the liver was strongly adherent to diaphragm. No adhesions of colon or spleen. The liver was enlarged and congested. Histological examination revealed a focus of cicatrization in the left lobe of the liver, probably from a former abscess. In the thick pus of the lung abscess were many motile haematophagous amoebae. [The condition of the lower bowel is not mentioned].

H. M. H.

TOMB (J. W.). **Thrombosis of the Spermatic Veins following Amoebic Dysentery.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1926. Nov. 25. Vol. 20. No. 4. pp. 288–289. [3 refs.]

European male, aet. 33 years, 5 years resident in India. "Clear" history of freedom from venereal disease; suffered from amoebic dysentery, emetine injections and emetine bismuth iodide by mouth; apparent cure about 26 days after onset of dysentery. Pain in right testicle and nausea. Spermatic cord, epididymis, and testis swollen and tender. On the cord close to external abdominal ring was a small exquisitely painful nodule, evidently caused by thrombosis of a vein of pampiniform plexus. Pain was severe enough to prevent walking. After one year, dysentery relapse (emetine injections and E.B.I.). Two weeks after acute symptoms of dysentery had disappeared, right testis and cord again became swollen and painful, examination revealing nodule and thrombosis of spermatic vein as before. During next 6 months several dysentery relapses, treated with numerous hypodermic injections of emetine. Right testis and cord throughout this period remained swollen and painful, and varicosity of right spermatic veins now appeared. Patient then invalided to England. During ensuing 6 months no dysentery, and testicular pain became less, but testis remained swollen and marked varicocele developed. He married, and though pain and swelling of testis and cord did not wholly disappear for over 18 months, during which time he had several mild relapses of dysentery (treated each time by injections of a few grains of emetine), the varicosity of spermatic veins cleared up within 6 months of marriage. The condition appeared to be permanently cured.

H. M. H.

PAOLINI (Renato). Antica atipica amebiasi intestinale nostrale complicata ad ascesso polmonare, ascesso subfrenico e ad empiema sinistro. [**An Atypical Indigenous Case of Intestinal Amoebiasis of Long Standing, complicated by Pulmonary and Subphrenic Abscesses and Left-side Empyema.**] —*Giorn. di Clin. Med.* Parma. 1926. Oct. 10. Vol. 7. No. 14. pp. 537–558.

The author presents a detailed report of an interesting case, followed by a clear and reasoned discussion of the various aspects of the subject.

The patient was a lad of 15 years with a history of acute rheumatism and chorea and with signs of aortic endocarditis. He had suffered for the last five years from crises of abdominal pain and diarrhoea, 3–4 stools daily, liquid and yellow in colour. An exacerbation of symptoms brought him to hospital. No amoebae were found in the faeces on his admission. Soon after, there developed a troublesome cough and an abscess burst into the lung. In the sputum *E. histolytica* was found and further examination of the faeces showed them to be present there also. Emetine was therefore administered.

Further access of fever and abdominal pain ensued and a left-sided subphrenic abscess formed which was treated surgically and in the pus from this amoebae were also seen. This was followed by a left-sided empyema which necessitated a second operation, and in the pus from this also the amoebae were discovered. Thereafter the patient passed an uneventful convalescence and left the hospital cured, 5 months after admission.

In the latter part of the paper the various complications, the symptoms, pathology and diagnosis are discussed in greater detail with frequent references to the literature.

H. Harold Scott.

TOMASELLI (Andrea). Su due casi importanti di amebiasi epatica. [**Two Important Cases of Amoebic Hepatitis.**]—*Riforma Med.* 1927. Jan. 3. Vol. 43. No. 1. pp. 3–4. [1 ref.]

A man of 35 years suffered from intermittent attacks of diarrhoea from 1916 to 1922, when they became more severe and were accompanied by passage of blood and mucus. Recently there had been pain in the abdomen, with fever and sweating. The liver was found to be enlarged; Wassermann reaction was strongly positive; his serum agglutinated *M. melitensis* up to 1 : 200; no amoebae seen in the stools.

Treatment for syphilis and on general lines for undulant fever gave no relief. Emetine in doses of 8 cgm. daily led to the disappearance of the fever in three days and subsidence of the hepatic enlargement and the pain. The emetine was continued, with alternate weeks of rest, for six weeks. With the clearing up of the liver-symptoms the agglutination of *M. melitensis* also disappeared. The diagnosis rests upon the effect of treatment with emetine.

The second patient was a man of 57 years, who had never suffered from diarrhoea, but had had fever for a week with shivering. The liver was enlarged, the spleen just palpable, the serum agglutinated *M. melitensis* in a dilution of 1 : 100; the faeces contained *E. histolytica* in both vegetative and cystic stages. Injections of emetine (8 cgm. for a dose) and stovarsol (2 tablets daily) banished the fever in two days. This patient was still under observation at the time of the report.

The chief point is the fact of the serum in each case agglutinating the organism of undulant fever, while the temperature was elevated, although not in high dilution, but sufficient to mislead if the possibility is not borne in mind.

H. Harold Scott.

PANAYOTATOU (Angélique). Abcès amibien du foie chez une fillette de cinq ans guéri par le traitement médical. [**Amoebic Liver Abscess in a Child aged Five cured without Operation.**]—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1926. Nov. 11. Year 42. 3rd Ser. Vol. 50. No. 33. pp. 1548–1551.

The author refers to two cases of "liver abscess," reported by others, in which cure without operation had been effected by emetine injections alone. [No exploratory puncture had been done; therefore, no matter how pronounced the clinical symptoms, they were not confirmed cases of abscess.]

The case, here recorded, was that of a female child 5 years old. Two months previously she had suffered from dysentery. On examination the child was gravely ill, the liver was very tender and enlarged 5 fingers' breadth below costal margin, and the temperature febrile. Operation was refused. *Exploratory puncture* withdrew 1½ cc. of pus, in which the microscope revealed scanty cysts of amoebae. No amoebae or cysts were found in the stools. Emetine injections and stovarsol by mouth were rapidly followed by disappearance of fever and return of liver to normal dimensions.

The author claims from this case: (1) Clinical signs of liver abscess, confirmed by exploratory puncture. (2) The thinner body wall makes exploratory puncture easy in the child. (3) Confirmation of the possibility of curing even a suppurating amoebic hepatitis of considerable dimensions by emetine therapy alone. (4) It is obligatory to try emetine therapy even in those desperate cases where operation appears to be inevitable.

[The presence of amoebic *cysts* in liver abscess pus, though reported often, still awaits reliable confirmation: puncture for drainage by aspiration costs the patient no more than puncture for exploration only.]

H. M. H.

HAYES (S. N.). **The Treatment of Hepatic Abscesses of Amoebic Origin.**—*Indian Med. Gaz.* 1927. Jan. Vol. 62. No. 1. pp. 13–14. With 1 text fig. [4 refs.]

A paper with twofold object—(1) To show that liver abscesses can be cured by emetine alone. (2) To suggest definite rules for their treatment.

It ought to be possible to divide liver abscesses into classes, each of which would receive its own particular form of treatment. Cogent considerations are—that (*a*) 75 per cent. of liver abscesses are sterile. [Presumably this means free from bacteria only. Is not the amoeba in the liver a pyogenic organism?] (*b*) Of the remainder many contain organisms of very low virulence. (*c*) Emetine is a specific for *E. histolytica*. (*d*) Abscesses may be single or multiple; the latter, the author believes, far commoner than one imagines.

Apposite cases from the author's own experience are described—they are claimed as typical of many, and to justify the dictum that when the amoebae are destroyed the pus will rapidly be absorbed.

Open operation—no open wound can be kept sterile. To open a sterile abscess knowing that the cavity will become infected is a procedure incompatible with present day knowledge.

Siphon drainage—may be used for infected abscesses and those in which aspiration has failed to evacuate the pus.

Aspiration—is surgically ideal: it empties the abscess while emetine kills the causative organism. But for multiple abscesses it is useless, as is any form of operation. In many cases pus will not flow through the cannula. The large abscesses of the past are rare—the commoner form to-day is the small abscess with 5 oz. or so of pus.

It is actually the author's own experience that a liver enlarged two finger-breadths below the costal margin can be reduced by emetine alone. Measurement by fingers serves as a rough guide for treatment. There will be many border line cases—but the tendency will be, with growing experience, to use aspiration less and less.

The rule—(1) With liver enlarged up to two finger-breadths below costal margin—treat by emetine injections alone. (Two courses grs. 1 daily for 8 days; with interval of 1 week between. After the first course the patient is usually well enough to attend as out-patient.). (2) With greater liver enlargement, or a definite fluctuating swelling, or resisting emetine alone—treat by emetine plus aspiration. (3) In cases not responding to above—treat by emetine plus siphon drainage. All patients should follow this up by a course of emetine bismuth iodide gr. 3 daily for 12 days.

[It is plain that under (1) will be included cases that are only hepatitis and not hepatic abscess—no doubt a purely academic point *if* the patient makes *complete* recovery: but it still remains that hepatic abscess is known only by demonstrating hepatic pus: if the needle must be used to demonstrate pus, evacuation of pus through the needle cannot be denied to the patient's welfare.]

H. M. H.

QUIMÉNER (E.). Contribution à l'étude du traitement des dysenteries amibiennes. [**The Treatment of Amoebic Dysentery.**]—*Bull. Soc. Path. Exot.* 1926. Oct. 13. Vol. 19. No. 8. pp. 672–674.

Describes briefly, as typical of many cases he had observed, three cases of amoebic dysentery in which apparent cure of first attack by emetine injections (6 to 8 of 0·08 gm. each) was followed by two further relapses after 2 to 3 months, each relapse apparently cured by emetine injections, but requiring smaller dosage and fewer injections to procure this relief than in the primary attack. He likens this chronicity and relapse to what occurs in syphilis and pleads that as in syphilis, so in amoebiasis, apparent cure of first attack should be followed at regular intervals by further courses of specific treatment.

Dr. Marcel LEGER discussing Quéméner's paper advocates far more thorough emetine treatment of the primary attack, followed up by stovarsol by mouth, and finally another course of emetine injections. He is certain that many cases of amoebiasis become chronic because the initial treatment has been insufficient. [If the appeal is to syphilis, then the quality and extent of treatment of the primary attack is the arbiter of the subsequent history of the case.]

H. M. H.

VAN STEENIS (P. B.). **On the Treatment of Amoebic Dysentery.**—*Far Eastern Assoc. Trop. Med. Trans. Sixth Biennial Congress, Tokyo, 1925.* Vol. 2. pp. 63–75. With 1 folding chart. [7 refs.]

Against the *histolytica* forms of *E. tetragena* both emetine and yatren gave good results; both failed in some cases. Stovarsol gave less good results against *histolytica* forms, and in one case it may have caused the icterus which developed during its administration. Against *minuta* forms and *cysts* of *E. tetragena* yatren and stovarsol gave good results. The author holds that emetine hydrochloride injected subcutaneously or intramuscularly is still indispensable for amoebic dysentery therapy. It prevents formation of metastatic amoebic abscess. Its disadvantage is its cumulative toxic action which prevents prolonged or oft repeated dosage. Yatren, without cumulative toxic action, is therefore very valuable in so-called " emetine fast " cases. It is especially efficacious against *minuta* forms and cysts. Yatren diarrhoea however, sometimes compels cessation of treatment. No toxic symptoms were noted from the use of stovarsol. [Stovarsol may produce severe arsenical dermatitis, as happens with the various salvarsan and neo-salvarsan compounds; these last also produce icterus and even fatal yellow atrophy of liver, and one of the author's stovarsol treated cases developed icterus.]

H. M. H.

VAN NITSEN (R.). Essais de traitement de la dysenterie amibienne par le nitsol. (Note préliminaire.) [**Treatment of Amoebic Dysentery by Nitsol.**]—*Rev. Méd. et Hyg. Trop.* 1926. Nov.–Dec. Vol. 18. No. 6. pp. 171–174.

In this preliminary note the author gives brief descriptions of 12 cases of dysentery in African natives with *E. histolytica* in stools. Intravenous injections of nitsol (Poulenc) were followed by relief of symptoms and disappearance of amoebae from the stools. The dose

varied from 5 to 15 cc. of nitsol given daily or every two or three days. The total amounts required before disappearance of amoebae from stools were 6 cc. (5 cases), 10 cc. (2 cases), 15 cc. (1 case), 20 cc. (2 cases), 25 cc. (1 case) and 27 cc.(1 case). Nitsol was well borne ; no ill after effects, local or general, were observed. It appeared to have selective action on the dysentery amoebae only. It had no effect on ankylostomes, bilharzia, strongyloides, trichocephalus, trichomonas, balantidium and lamblia.

H. M. H.

i. Urchs (O.). Zur Behandlung des tropischen Dickdarmkatarrhs. [**Treatment of Tropical Colitis.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1926. Dec. Vol. 30. No. 12. pp. 715–719.

ii. ——. Technische Bemerkungen zum Rivanolklysma. [**Technique of Rivanol Administration per Rectum.**]—*Ibid.* 1927. Mar. Vol. 31. No. 3. p. 141.

i. For the treatment of amoebic dysentery, the most important cause of chronic colitis in the tropics, the physician has at his disposal two remedies—Yatren 105 and emetine. A third worthy to rank with these two in the treatment of ulcerative haemorrhagic colitis (of varying aetiology) is Rivanol.

He gives brief accounts of 7 cases, including negroes, mixed European-Negro descent, and one Chinaman, occurring in Surinam. All presented a more or less pronounced dysentery syndrome. In one case with *E. histolytica* in stools—emetine injections brought no relief of symptoms. Rivanol solution 500 cc. per rectum daily was followed by rapid disappearance of symptoms and amoebae from the stools.

In one case no amoebae were found in stools ; emetine had no effect. Rivanol solution per rectum procured rapid apparent cure of the dysentery. In three cases of dysentery, *E. histolytica* in stools, rivanol solution per rectum procured rapid relief of symptoms and disappearance of amoebae from the stools. (No emetine had been given). In two cases the bloody mucous stools revealed no amoebae or cysts but many *Schistosoma mansoni* ova. In both cases rivanol solution per rectum and antimosan intravenously was rapidly followed by relief of symptoms and disappearance of *mansoni* ova from the stools.

ii. In order to receive rivanol treatment, ambulatory patients must be put to bed for at least half a day. Tenesmus is controlled by tinct. opii ; it will disappear after one or two rivanol injections. A preliminary cleansing non-irritating enema is given. Rivanol is dissolved in *distilled* water 1/2,000 ; and 500-800 cc. of the solution at body temperature is given per rectum, the patient lying on back or side ; and if ulceration of caecum or ascending colon be present, then in knee-elbow position. The injection must be retained as long as possible, and at least for 15 minutes.

H. M. H.

Dobell (Clifford) & Laidlaw (P. P.). **On the Cultivation of *Entamoeba histolytica* and some other Entozoic Amoebae.**—*Parasitology.* 1926. Sept. Vol. 18. No. 3. pp. 283–318. [25 refs.]

In a summary of their work the authors state that they have successfully used the method of Boeck and Drbohlav for cultivating various entozoic amoebae of man and monkeys besides *E. histolytica*. These

amoebae and their sources and their several designations (with the probable and possible synonyms in each case) are set forth in the preliminary pages. Various modifications of the B. & D. technique have been tried, with the objects (1) of obtaining richer cultures, (2) of obtaining individual cultures in which amoebae would live and multiply for a longer term than 2 or 3 days, and (3) of securing under cultivation the complete life history of the amoebae, to the final formation of cysts. The composition and preparation and control of these modified media are described and discussed in thirteen-and-a-half critical pages; it would be no useful service to attempt the impossible task of summarizing them; it must be enough to say that the desired objects—including encystation and excystation of *E. histolytica* were attained by adding solid rice-starch (a material highly unfavourable to Blastocystis) to the culture-medium—under critical conditions The very precautionary methods by which the authors have succeeded. in initiating cultures from cysts are described and discussed; as well as the isolation of pure cultures of a particular species. A discussion is opened out, but not yet completed, on the influence of the concomitant bacterial flora. A concluding section describes experiments showing effects of cultivation on the infectivity of *E. histolytica*; its penultimate paragraphs state that the observations described show "that ability to ingest red blood-corpuscles is in no way correlated with ability to infect and produce dysentery in kittens," and "that cultivation of *E. histolytica* in starch-containing media leads—at least in some strains—to complete loss of infectivity, virulence, and pathogenicity for kittens, though such cultivation does not in any way cause the amoebae to lose their taste for human red blood-corpuscles even after a prolonged period (at least 17 months)."

A. Alcock.

Craig (Charles F.). **Observations upon the Cultivation of** *Endamoeba histolytica.*—*Amer. Jl. Trop. Med.* 1926. Nov. Vol. 6. No. 6. pp. 461–464. [1 ref.]

The author had previously described the cultivation of *E. histolytica* for long and continuous periods of time in medium consisting of 7 parts Locke's solution and 1 part inactivated human, horse, or rabbit blood serum. Cultures in this medium proved pathogenic for the kitten. He now describes a still more simple medium, equally successful for the culture of *E. histolytica*. This species can be cultivated apparently indefinitely in mixtures of (1) a modified Ringer's solution and human blood serum, and (2) normal salt solution and human blood serum.

(1) Modified Ringer's solution :—

NaCl	8.00 grammes.
$CaCl_2$	0.20 gramme.
KCl	0.20 gramme.
Distilled water	1,000 cc.

Filter, sterilize, and to each 7 parts add 1 part human blood serum inactivated at 56° C. for 30 minutes. Filter mixture through Mandler filter and keep in incubator at 37° C. to determine sterility. Keep in incubator at 37° C. until inoculated.

By daily transfers *E. histolytica* can be maintained easily in this medium.

(2) To 7 parts of normal salt solution (0.85) which has been autoclaved, add 1 part inactivated (56° C. for 30 minutes) human blood serum. Filter through Mandler and keep in incubator at 37° C. to determine sterility—if sterile keep in incubator at 37° C. until used. To inoculate, a small

lump of faeces is mixed with medium and examined at end of 24 hours, the inoculated tube being kept in incubator at 37° C. If culture shows *E. histolytica* it can be maintained easily in this medium by daily transfers. Both these media (1 and 2) markedly inhibit the growth of bacteria.

It is evident that coagulated egg or blood, a solid substratum and none of the constituents of Locke's or Ringer's solutions, except possibly NaCl, are essential for the cultivation of *E. histolytica*. Not even the dextrose of Locke's solution is necessary. The amoeba grew well in a mixture of inactivated human blood serum and Locke's solution sans dextrose. [The greater certainty of diagnosis by culture obviously makes any simplification of culture medium and technique of real practical importance and benefit to patient and physician.]

H. M. H.

Vogel (H.). Ueber Kulturen der Ruhramöbe und deren Beeinflussung durch Yatren. [**Cultivation of the Amoeba of Dysentery: the Influence of Yatren.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1927. Feb. Vol. 31. No. 2. pp. 74–88. [20 refs.]

The author describes Boeck and Drbohlav's method of cultivating *Entamoeba histolytica* and later modifications of the culture medium. He describes briefly the cases from which his strains of *E. histolytica* were obtained and in full detail his methods of culture, the morphology, behaviour and virulence of the cultivated amoebae and finally the action in vitro of yatren on the amoebae in culture. Dysentery amoebae were cultivated from 6 human cases of dysentery, one human amoeba carrier and from the gut of an ape which had died from a dysentery syndrome. The best culture medium was found to be solid agar, covered with a layer of egg white solution to which is added powdered blood agar. Cyst formation was observed in three strains. One strain (from a human case of acute dysentery) in the course of cultivation lost its infectivity for man and kittens. Yatren was found to have a direct lethal action on *E. histolytica* in vitro. A solution of 1/100 killed the amoebae in a few hours; solutions of 1/1,000 and 1/5,000 inhibited multiplication and the cultures gradually died out. *E. histolytica* proved resistant to solutions 1/10,000 through 10 subcultures. After being kept 15 hours in 1/1,000 yatren solution, the amoebae when transferred to yatren free medium regained the ability to multiply; if this period were longer than 15 hours inhibition of multiplication was irreparable.

H. M. H.

Yokochi (Kiichi). **An Investigation on the Habituation of Amoeba.**]—*Aichi Igakkwai Zasshi (Jl. Aichi Med. Soc.).* 1926. May. Vol. 33. No. 3. [Summarized in *Japan Med. World.* 1926. Dec. 15. Vol. 6. No. 12. p. 354.]

The author found that amoeba could not live in distilled water, urine, bile, milk plasma, and milk serum. It could live in hydrochloric acid, table salt, carbolic acid, corrosive sublimate, up to a certain concentration of these substances.

[Species of amoeba and limit of concentration of any of the substances tested are not stated, but in view of reported findings of *E. histolytica* in gall and urinary bladder it is perhaps interesting to note that urine and bile had lethal effect on an amoeba.]

H. M. H.

Funke (John). **The Use of Yatren in Amebic Dysentery.** *Therap. Gaz.* 1926. Sept. 15. 3rd Ser. Vol. 42. No. 9. pp. 621–622.

A guarded approval of yatren—"In all probability it will in a large measure replace ipecac., and . . . is considerably superior to stovarsol." A sketchy account is given of yatren therapy in amoebic dysentery.

H. M. H.

Bacillary Dysentery.

Worms (G.), Lesbre (Ph.) & Sourdille (Gabriel). Specificité des infections oculo-articulaires tardives dans les dysenteries bacillaires. [**Specificity of Late Oculo-Articular Symptoms in Bacillary Dysentery.**]—*C. R. Soc. Biol.* 1926. Oct. 29. Vol. 95. No. 30. pp. 1042–1043.

In the course of an epidemic of dysentery, due first to Shiga and then to Hiss bacilli, successively, out of 9 patients 7 showed, besides joint complications a mild scleroconjunctivitis. In all the serum agglutinated Hiss bacillus only in dilutions of 1/200–1/600. One other case showed iritis and corneal ulcers; the serum agglutinated Shiga and Hiss in 1/50 dilution; the case gave a strong intradermal reaction with Shiga toxin. He was treated with dysentery anatoxin, which the author prefers to serum. In four cases with severe arthritis the joint fluid showed, besides intense polymorphonuclear leucocytosis, gram-negative cocco-bacilli. Subculture failed. The author was able to demonstrate anti-dysentery bacteriophage in the fluid. The joint fluid agglutinated Hiss bacillus in dilutions varying from 1/100 to 1/400. The tears of the ocular cases proved to be sterile—nor did they contain specific agglutinins. From the stools of these cases were isolated pseudo-dysentery bacilli, non-agglutinable. Culture of urine revealed none of the coli-dysentery group.

H. M. H.

Spranger (H.). Der Nachweis von Ruhrbazillen im Blut. [**Demonstration of Dysentery Bacilli in Blood.**]—*Muench. Med. Woch.* 1926. Nov. 12. Vol. 73. No. 46. p. 1926. [5 refs.]

The author notes that in the general opinion the bacillus of dysentery is not found outside the alimentary canal. However, Ghon and Roman (1915) reported finding type *Y* bacillus in blood and urine of 9 cases, in the milk in 2 cases, and in the gall bladder in one case. Nowicki (1927) reported *Flexner* bacillus once in the urine; *Shiga* twice, and *Y* type once in the milk. Fränkel (1915) recorded *Y* type once in the blood and once in the urine: Ungermann (1918) reported finding dysentery bacillus once in the blood, as did Bossert and Leichtentritt (1920). The author records in this paper finding *Y* type by blood culture in bile medium, in two cases of dysentery, and again in the blood, *Shiga* in two cases, *Flexner* in one, and *Y* type in one. In some of these cases Widal tests of the blood, and stool cultures, were negative for the dysentery group. It is plain that dysentery bacilli frequently appear in the blood. Bile is an excellent medium for their cultivation—and in view of the difficulty often experienced in culturing them from stools, and the frequent negative Widal reaction in dysentery cases, blood culture in bile is an important additional aid to accurate and early diagnosis.

H. M. H.

Spranger (H.). Das Wachstum der Ruhrbazillen in der Galle. [**Cultivation of Dysentery Bacilli in Bile.**]—*Muench. Med. Woch.* 1926. Dec. 31. Vol. 73. No. 53. pp. 2247–2248. [2 refs.]

This investigation of bile as a medium for dysentery bacillus culture shows that ox bile is a favourable medium for the growth of *Flexner* and *Y* types of dysentery bacillus, but rather inhibits the growth of *Shiga-Kruse* bacillus. This inhibition can be fully overcome by the addition of a small amount of blood. He recommends, for the diagnosis of dysentery, blood culture in bile or bouillon.

H. M. H.

i. Clayton (F. H. A.). **A Case of "Sonne" Dysentery in England.** *Lancet.* 1927. Feb. 19. p. 391. [8 refs.]
ii. Nabarro (David). **"Sonne" Dysentery in Great Britain.** [Correspondence.]—*Ibid.* Feb. 26. p. 460.

i. Carl Sonne (1914) described, in addition to Shiga and Flexner groups, a third variety, found in mild cases, which differs from them culturally and serologically. This Sonne type has been identified since in France, Norway and Sweden and in Australia. A considerable epidemic due to it occurred in Aberdeen in 1924. [One of the Sonne Aberdeen dysentery cases subsequently developed toxic arthritis.] Channon (1925) obtained the Sonne bacillus in England from faeces of a man who had had dysentery in Egypt. The author describes a case of dysentery occurring in Durham, in September, 1926, from whose stools the Sonne bacillus was isolated. The case had a possible contact relation to the Aberdeen epidemic.

ii. Dr. David Nabarro comments on Clayton's paper. He believes that dysentery is much more prevalent amongst the general population than is generally recognized. As result of his investigations during several years he has come to the conclusion that the organisms he isolated from many cases of epidemic and other forms of diarrhoea in London, in 1921, and named *B. coli anaerogenes* are really identical with those isolated by Sonne from some of his cases in Denmark.

H. M. H.

Fraser (A. M.), Kinloch (J. Parlane) & Smith (J.). **Sonne Dysentery in Aberdeen.**—*Jl. of Hyg.* 1926. Nov. Vol. 25. No. 4. pp. 453–460. With 2 charts in text.

Routine examinations of enteritis cases in Aberdeen over a period of 30 months, with no epidemic prevalence, have given 6 of amoebic dysentery, 17 of Flexner dysentery, and 33 of Sonne dysentery. Most of the Flexner and Sonne dysenteries were in institutions where the inmates are under strict medical observation. The authors do not take the above figures as necessarily representing the relative proportions of dysenteric affections but they affirm: "So far as the evidence goes, therefore, it may be concluded that the Sonne bacillus is the most frequent cause of dysenteric outbreaks in Aberdeen."

The symptoms of Sonne dysentery are usually those of an irregular subacute diarrhoea with green stools containing mucus. Exceptional cases are more urgent and may show (1) sudden onset, diarrhoea and

colic, with blood and mucus in the stools, or (2) sudden onset, epigastric pain, vomiting, diarrhoea, green stools with mucus but no blood, and rapid prostration. The temperature is elevated in greater or less degree according as the affection is of the severe or the milder type.

Colonies of the Sonne bacillus are larger and more opaque than Flexner colonies and often have crenated edges. Lactose is fermented by the primary culture in 3 to 5 days; subcultures come to ferment this sugar more rapidly. Subcultures ferment glucose, mannite, arabinose, rhamnose, maltose and saccharose but give rise to no change in xylose, dulcite, sorbite and inulin. Primary cultures are not agglutinated after 4 hours at 55° C. Subcultures however become agglutinable and all strains absorb agglutinins.

The blood from 31 cases taken 7 to 20 days after onset gave agglutination in 17 of these in dilutions ranging from 1–50 to 1–6,400.

W. F. Harvey.

Murakami (Katsuro). Ueber Milch gerinnende Arten von Pseudodysenterie-bazillen. [**Milk-coagulating Pseudodysentery Bacilli.**]—*Cent. f. Bakt.* I. Abt. Orig. 1927. Feb. 5. Vol. 101. No. 6–7. pp. 377–383. [14 refs.]

Kruse divided pseudodysentery bacilli into types A to H and his type E was one which by slowly fermenting lactose caused coagulation in milk. Such strains are commonly to be found in sporadic dysentery cases. Sonne characterizes milk coagulating strains of dysentery bacilli as his type 3. These organisms are also described by Japanese authors—Ohara, Mita, Adachi, Nakamura and Murakami. The Ohara strain, by agglutination test, appears to be a distinct type, allied on the one hand to Aoki's type 7 and on the other to Aoki's type 9. Their relationship to Kruse's type E has not been determined. It may be more correct to regard these organisms as atypical *B. coli* with close cultural and serological relationship to the dysentery bacilli.

W. F. H.

Nissle (A.). Ein neues Anreicherungsverfahren zum Nachweis von Typhus-, Paratyphus- und Ruhrbazillen im Stuhl. [**An Enrichment Process for Typhoid, Paratyphoid and Dysentery Bacilli in Stools.**]—*Muench. Med. Woch.* 1927. Feb. 4. Vol. 74. No. 5. pp. 185–186.

The enrichment medium is intended as supplementary to direct inoculation of Endo medium and the use of malachite green agar. It is prepared as follows:—

(1) Dissolve pot. iodide 1 gm. in 65 cc. sterile ox bile; (2) add 4 cc. 1 per cent. malachite green and 30 cc. 3 per cent. caffein; (3) distribute in amounts of 10 cc. in sterile tubes of 16 to 20 mm. diameter; (4) sow with about ¾ to 1 cc. stool; (5) incubate 12, but not more than 15 hrs.; (6) remove the tubes without shaking; (7) sow 1 to 2 loopfuls of the surface growth on Endo plates of not less than 15 cm. diameter; (8) examine after overnight incubation and proceed to further tests.

W. F. H.

Schöbl (Otto). **Review of Investigations on Bacillary Dysentery.** — *Far Eastern Assoc. Trop. Med. Trans. Sixth Biennial Congress, Tokyo, 1925.* Vol. 2. pp. 387–394.

1. *Viability in stools.* *B. dysenteriae* is fairly resistant to drying; it will survive longer in salt water than in tap water; physiological salt solution and bile favour survival and a combination of the two may help to preserve the life of this organism.

2. *Carriers.* Healthy carriers have been demonstrated and the serum of the carrier usually agglutinated his own strain to a less degree than laboratory strains.

3. *Serological grouping of Shiga strains.* By cross agglutination and cross adsorption tests the majority of Philippine strains were shown to belong to a large group. A small group was made up of most of the strains of *B. dysenteriae* Shiga obtained from abroad, while another group was found which belonged to neither the large or small groups.

4. *Constancy of type.* Shiga strains remained constant in character. Flexner strains could be easily transformed to type Y.

5. *Normal agglutinins and* B. dysenteriae. Local strains of Shiga, with few exceptions and these mostly from carriers, were inagglutinable by normal rabbit serum while certain strains from abroad were slightly agglutinable. Local strains of Flexner were all promptly agglutinated. "The slightly agglutinable Shiga strains showed without exception small flakes and loose sediment, while the Flexner agglutination. showed large flakes and firmly packed sediment." [See also *ante*, Schöbl & Villaamil, p. 24.]

6. *Production of serum.* One group consisted of horses receiving live cultures intravenously at weekly intervals, commencing with 1/100 of a slant. The other three groups received subcutaneously live culture, extract, and polyvalent treatment respectively. No difference was found in the results of subcutaneous treatment and the agglutination titre of the serum was only about 1 in 300. The intravenous method of treatment produced a high agglutination titre, 1 in 4,000, by the time two whole slants were injected in one dose, but it was apt to produce collapse towards the end of the course with risk of loss of the animal. The method of immunization therefore for practical purposes, which is favoured, is that of subcutaneous injection of living culture.

W. F. H.

Shiga (K.). **On the Therapeutic Value of Antitoxic and Antiinfectious Dysentery Serum and Therapeutic Unit of Antitoxic Serum.** — *Far Eastern Assoc. Trop. Med. Trans. Sixth Biennial Congress, Tokyo, 1925.* Vol. 2. pp. 439–444.

The standardization unit adopted is that which can neutralize 10 times the lethal dose of toxin for rabbit or mouse. The efficacy of antibacterial (antiinfectious) as distinct from antitoxic serum is open to doubt. An antitoxic serum is prepared by the injection of bacilli, so that an antitoxic serum is also more or less antibacterial or bactericidal. Which of these properties is of greater value in the treatment of Shiga dysentery?

The two sera used were: (1) Antitoxic containing 160 immune units in 1 cc.; and (2) antibacterial capable of protecting the mouse in

a dose of 0.25 cc. or less against 4 times the lethal dose of bacilli. Twenty-nine cases of Shiga dysentery were treated with antitoxic serum, 8 with remarkable effect, 10 with less remarkable effect, and 11 with little or no effect owing to lateness of administration. Three cases treated with the same dose of antibacterial serum were much less benefited. Pharmacological experiments by OSAWA show that small doses of dysentery toxin stimulate Auerbach's plexus, accelerating peristalsis, while larger doses paralyse, and that antitoxic serum in dilution of 100,000 to 1,000,000 is capable of neutralizing this toxic action. The conclusions drawn are: (1) Antitoxic serum is to be preferred to antibacterial in clinical treatment of Shiga dysentery; (2) the proper curative doses can be estimated in the adopted units, while the anti-infectious (bactericidal) titre affords no therapeutic standard: (3) in the treatment of Shiga dysentery it is estimated that 3,000 to 4,000 units are required for mild or early cases, 5,000 to 7,000 for moderate and 7,000 to 10,000 for severe.

W. F. H.

FUTAKI (K.). **The Dysentery Bacilli in Japan and their Classification.**—*Far Eastern Assoc. Trop. Med. Trans. Sixth Biennial Congress, Tokyo, 1925.* Vol. 2. pp. 395–403.

The organisms responsible for epidemics of dysentery in Japan during the past 23 years are the "Komagone bacilli" A and B, first isolated in 1903. Reports from various hospitals in Tokyo show the relative percentage frequency of dysentery organisms as Shiga 2·2, Komagone A 31·2, Komagone B 66·6. The "Komagone" organisms differ from both Shiga bacilli and the original Flexner bacilli in their absorption agglutination reactions. They are non-toxic and ferment mannite. By their fermentation of galactose they are distinguished from the original Flexner strain. For the classification of dysentery bacilli the absorption serum test, supplemented by the results of fermentation of mannite, arabinose, maltose and galactose are recommended.

W. F. H.

MORISHIMA (Kan-Ichiro). **Mutation of** *B. dysenteriae.* **(So-called Flexner Types.)**—*Far Eastern Assoc. Trop. Med. Trans. Sixth Biennial Congress, Tokyo, 1925.* Vol. 2. pp. 405–422. With 10 figs. [29 refs.]

Dextrin agar plates were used for the production of variants. The mannite fermenting original culture developed as a round slightly opaque whitish colony. By the third day there developed on the edge of the colonies an irregular dense colony with eclipse-like zone, 3 or 4 times the size of the original and relatively transparent colony. One of these opaque colonies, derived from a Y strain (that is to say, a strain not fermenting, or only fermenting maltose and dextrin with difficulty after some 3 weeks) will show acid production in maltose and dextrin broths within 48 hours. Thus the variant had developed Flexner characters. The reverse type of variant, one deprived of its original acid-producing power, was never obtained. Similarly it is possible to obtain two kinds of colonies from the relatively transparent original, but not from the opaque variant. A Flexner type may split into Y and Flexner types and *vice versa*. Simple agglutination tests failed

to differentiate between opaque and transparent colonies, but all transparent colonies absorbed agglutinin both for transparent and opaque colonies, while opaque colonies did not do so for transparent colonies. (See also this *Bulletin*, Vol. 23, p. 670.)

The conclusions drawn are : " (1) The Shiga-Kruse group appears to be stable ; (2) The subgrouping of the mannite fermenters appears to be of little importance and all the members of this main group should be considered as more or less interchangeable variants."

W. F. H.

Onomura (Yonekichi). **Experimental Studies on the Pathogenicity of *Bacillus dysenteriae* Komagome B (Futaki).**—*Scientific Reports Govt. Inst. Infect. Dis.* Tokyo. 1925. Vol. 4. pp. 71–101. With 29 charts. [16 refs.]

1. The oral introduction of *B. dysenteriae* merely showed that the bacilli were able to reach at most, and that seldom, the mesenteric glands. Injection *per rectum* gave more positive results as regards entry into the blood circulation : a few organisms were found in a certain proportion of the animals used, not only in the mesenteric glands, but also on occasion in the heart, liver, spleen, gall bladder pancreas, kidney, suprarenal capsules, lung and bone marrow, thus showing that the organism is capable of entering the blood through the walls of the colon.

2. The organisms entering the blood are rapidly killed. Those that escape destruction are eliminated by way of the urine, bile and intestinal walls : otherwise they are destroyed in the organs into which they have found their way.

3. Agglutinins appeared after injection of bacilli *per rectum* but not *per os*, thus indicating, in the opinion of the author, that living organisms can and do enter the blood circulation by way of the intestine, and that these, though killed, give rise to the agglutinins.

4. Bacteriophage was difficult to find in the intestinal contents after intravenous injection of living bacilli but was found after ingestion *per os* and after injection *per rectum*. Numerous experiments are given showing the details of the results which have led to these conclusions.

W. F. H.

Hartoch (O.), Schlossberger (H.) & Joffe (W.). Zur Biologie der Dysenterieerreger mit besonderer Berücksichtigung der Katalasereaktion. [**Biology of Dysentery Bacilli, with Special Reference to the Catalase Reaction.**]—*Ztschr. f. Hyg. u. Infektionskr.* 1926. Oct. 28. Vol. 106. No. 4. pp. 666–678. [12 refs.]

The authors summarize their work as follows :—

1. Among the different species of dysentery bacteria no relationship can be demonstrated between the action of the several strains towards mannite and maltose on the one hand and their capacity on the other to utilize simple nitrogenous foodstuffs such as ammonia and asparagin.

2. Among the mannite fermenting strains likewise, the so-called colitis bacteria, no correlation exists between the intensity of utilization of ammonia, their action on maltose and their serological reactions.

3. The catalase reaction can be employed only with a certain amount of reserve for the differentiation of dysentery bacilli, for not only

Shiga-Kruse bacilli, but also occasionally bacilli of the colitis group are unable to decompose hydrogen peroxide.

4. The catalase-negative mannite fermenting strains can be distinguished serologically from the catalase-positive colitis strains.

W. F. H.

SARDJITO (M.). **Immunization against Bacillary Dysentery by Means of Bacteria Lysate of Shiga-Kruse Bacilli obtained by Bacteriophagic Action.**—*Meded. Dienst d. Volksgezondheid in Nederl.-Indië.* 1926. Pt. 4. pp. 316–332. [12 refs.]

For the vaccine, as originally prepared, a highly virulent Shiga-Kruse strain was used, while the bacteriophage itself had been brought to a high titre of virulence for dysentery bacilli by repeated inoculations on Shiga-Kruse cultures and filtrations.

The actual preparation is described as follows: (1) Use a 24 hr. Shiga-Kruse agar culture; (2) add to a suspension of 300 million bacilli in Martin bouillon of pH 7·5, 2 cc. of bacteriophage; (3) keep overnight at 37° C.; (4) add to the now clear bouillon another 200 million Shiga-Kruse bacilli; (5) incubate 24 hrs. till clear; (6) add still another 200 million bacilli to this clear bouillon and incubate again for 24 hrs.; (7) filter and test for sterility; (8) keep the lysate thus prepared for one month at room temperature before using as vaccine.

The modifications made on the preparation as described were designed to lessen the reaction given by the vaccine. The addition of formalin proved an advantage in this connexion, but the acidity of the formalin had to be neutralized. The results on rabbits, by subcutaneous injection and *per os*, were encouraging and it was shown that the injection of 1 cc. of formalinized vaccine subcutaneously did not cause a serious reaction in man.

W. F. H.

GLOUKHOFF (K. T.), WOLKOWA (E. A.), EROUSSALIMTCHIQUE (G. L.) & PANINE (L. G.). [Vaccinothérapie de la dysenterie bacillaire " per os."] [**Vaccine Treatment by Mouth in Bacillary Dysentery.**]—*La Médecine Prophylactique.* 1926. July–Aug. Nos. 7 & 8. p. 64. [Summarized in *Bull. Inst. Pasteur.* 1926. Oct. 31. Vol. 24. No. 20. pp. 909–910.]

During an epidemic of dysentery at Leningrad in the summer of 1925, 105 patients were given vaccine treatment per os. 81 were closely observed. 19 of them were grave cases—toxic, high fever, frequent stools, vomiting and severe abdominal pains. 20 cases were of medium severity and 42 were mild. Treatment consisted of ingestion of tablets containing 100 million Shiga and Flexner bacilli. The tablets were dissolved in 50 cc. of water and the emulsion taken fasting. Adults received two–three tablets a day to the exclusion of all other medicaments. Some were given, by the mouth, an emulsion of dysentery bacilli with 20–25 per cent. added alcohol 96°, incubated for two days (ZABOLOTNY). The majority of these vaccine treated cases showed in the first 24 hours marked improvement. The earlier from onset of illness the vaccine was given the better the result. Comparison between these vaccine treated cases and the other dysentery cases treated at the same time with serum, in the same hospital, compelled a verdict in favour of the vaccine. Considering only the

severe and moderately severe cases—serum treated cases had mortality of 27 per cent. [numbers not stated]; vaccine per os treated cases had mortality 7·7 per cent. [presumably among 39 cases.].

H. M. H.

Gupta (C. C. Das). **The Treatment of Bacillary Dysentery by Cresol.**—*Indian Med. Gaz.* 1926. Oct. Vol. 61. No. 10. p. 499.

F. J. Palmer (1924) has reported satisfactory results from cresol (Sanitol) in bacillary dysentery.

Fifty cases of dysentery on a tea estate were being treated by emetine injections without success; the author suspected the outbreak to be bacillary, and on clinical grounds diagnosed it as such. He gave m.i. of cresol in 1 oz. water per os three times a day for four days. In most cases marked improvement appeared after the 6th dose, and all symptoms subsided with three more doses on the third day. Besides the cresol per os, in the severer cases, 25 cc. antidysentery serum was injected subcutaneously.

The author urges trial and report on cresol by mouth. He believes that it would be indeed a boon should it prove as efficacious in bacillary dysentery as is Tomb's essential oils mixture in cholera.

H. M. H.

Takematsu (Susumu). [**On a Species of Bacilli isolated from a Case of Dysentery.**]—*Gun-I-Dan Zasshi* (*Jl. Army Med. Corps.*). 1926. Mar. No. 153. [Summarized in *Japan Med. World.* 1926. Dec. 15. Vol. 6. No. 12. pp. 358–359.]

The bacillus isolated disappeared from the stools after the 20th day. It was non-toxic to the rabbit and differed from other such species in its action on milk, which was coagulated from the bottom on the 2nd day and gave a thin layer of yellowish transparent whey by the 4th day. Immune rabbit serum of this bacillus showed strong agglutination for the homologous organism and very weak for all dysentery and *B. coli* group organisms.

W. F. H.

Mixed and Unclassed Dysentery.

i. Rhodes (W. F.). **Pathology and Laboratory Diagnosis of the Dysenteries.**—*Jl. Med. Assoc. S. Africa.* 1927. Jan. 8. Vol. 1. No. 1. pp. 4–6.

ii. Taylor (A. B.). **Medical Side of the Dysentery Group.**—*Ibid.* pp. 6–9.

iii. Pearson (M. G.). **The Surgical Aspect of the Dysentery Group.**—*Ibid.* pp. 9–10.

iv. Kaplan (M. W.). **The Paediatric Aspect of the Dysenteries. (Contributions to a Symposium at the Natal Coastal Branch.)**—*Ibid.* pp. 10–13.

i. A concise review of the subject in which it is pointed out that by examination of smear from a *fresh* stool it is possible to diagnose the type of dysentery, from the character of the cellular exudate. [These characters have often been detailed and their importance emphasized in this *Bulletin*.] Cultural methods in acute bacillary dysentery involve a delay of two days before results are given—the

two most valuable days for treatment. For the rest the author notes that bacillary dysentery stools are odourless and alkaline to litmus, whereas amoebic dysentery stools are strongly foetid and acid to litmus.

ii. Usually the physician is able to confirm the patient's own diagnosis of "dysentery"—and but for "the differential diagnosis between bacillary and amoebic dysentery and the scientific treatment of either type—dysentery would come under the class of "chemist-treated diseases." This differentiation clinically is practically impossible. If a guess must be hazarded, then bacillary dysentery tends to be of sudden onset, with initial fever and toxaemia; amoebic of slower onset with less fever and toxaemia and less abdominal pain and tenesmus. The bacillary stool contains as a rule much fresh blood and much gelatinous mucus and gives little odour. A very malodorous bloody stool containing thin mucus is more likely to be amoebic. At autopsy perforation of bowel or intestinal haemorrhage characterize amoebic dysentery, while in bacillary dysentery death results from toxaemia and physical exhaustion and is less sudden therefore than in amoebic cases. The use of emetine for diagnostic purposes is excused for mild cases: it is deprecated for more acute cases, for the delay of two or three days may account for chronicity in the bacillary type. [In both mild and acute bacillary type emetine may account too for death.] Antidysenteric serum and sodium sulphate is advocated for treatment of the bacillary cases and emetine for the amoebic.

iii. Obstruction after dysentery usually is found to be due to malignant disease of the colon. The surgeon may help to diagnose amoebic hepatic abscess but he has little else to do. Aspiration and emetine injections will cure all but a very few abscesses. The open operation is rapidly becoming a thing of the past. "So that when the whole subject is 'boiled down' the surgery comes to this: that in chronic cases of dysentery which resist other means, appendicostomy may be extremely valuable."

iv. Bacillary dysentery is far commoner in infancy than is generally believed. The first year of life provides the largest number of cases. Amoebic dysentery is extremely rare under the age of two. Over that age it runs the same course as in adults, but amoebic abscess is very rare. Diarrhoea in children is often in fact bacillary dysentery. Differential diagnosis depends on stool examination. A rectal examination will exclude intussusception. Treatment of the bacillary type is mainly dietetic: with sodii sulph. by mouth. In amoebic dysentery in infants a child of two should be given gr. $\frac{1}{4}$ emetine daily for 12 days.

H. M. H.

KAWATA (Keiji). **On Ekiri, an Epidemic Infantile Diarrhoea.**—*Far Eastern Assoc. Trop. Med. Trans. Sixth Biennial Congress, Tokyo, 1925.* Vol. 2. pp. 723–726.

In several districts of Japan there prevails, mostly in summer, but in spring and autumn also, a very acute disease of infants with sudden onset, fever, muco-diarrhoeic slightly sanguineous stools, cramps of limbs, collapse. Death or recovery may follow within 24 hours of onset. Mortality varies between 39 and 82 per cent. This disease is named ekiri, and the author thinks it is probably the same as the summer diarrhoea of infants in America. Many investigators have found a *pseudo-dysentery bacillus*, which is believed to be the cause of the

illness. An adult infected with ekiri shows symptoms of simple dysentery, and dysentery in a family may be passed on to the infant in whom it shows as ekiri. Suckling infants are never affected. In France Remlinger and Dumas demonstrated inflammatory swelling of suprarenal glands in dysentery corpses. Niiho has demonstrated the same in ekiri. Among very many treatments the author has found (since 1918) injection of adrenalin subcutaneously, 0·3 to 0·5 cc. of 1/1,000 solution, as early as possible after onset of illness, to be the only effective remedy. The patient must also be given abundant quantities of liquid—water, lemonade, sugared water—to drink. Adrenalin 8 hours after onset of ekiri is practically useless. In 78 cases this treatment has reduced mortality to 7 per cent. Death in ekiri can be traced to heart failure due to functional insufficiency of the suprarenal glands, which may be made up for (in part) by the adrenalin injections. He pleads for its trial in summer diarrhoea.

H. M. H.

Pacheco (Genesio). Conceito actual das dysenterias e as dysenterias entre nós. [**Present-day Notions of Dysentery; the Disease as found in Brazil.**]—*Sciencia Med.* 1926. Dec. 31. Vol. 4. No. 12. pp. 627–662. With 1 chart in text. [1 ref.]

Faeces were sent for examination to the author's laboratory which was some distance from the hospital, and clinical data were rarely obtainable. 107 specimens were examined and 60 per cent. yielded positive results. In this were included 25 cases of infantile diarrhoea. *E. histolytica* was found in three (2·8 per cent.); dysenteric bacilli were isolated 57 times, namely, that of Russell & Hiss 30 (28 per cent.), Shiga 20 (18·7 per cent.), Flexner 5 (4·6 per cent.) Schmidt 2 (1·8 per cent.); Strong's was not found in any. *B. paratyphosus* B. was isolated on three occasions, twice from adults and once from a child of 9 months.

In Rio de Janeiro, dysentery is eighth on the list of the causes of death, accounting for 316 cases in 1924 and 435 in 1925; in S. Paulo 151 deaths were notified from dysentery in 1925. The populations are not stated.

Appended to the paper is a tabulated list of the cases, giving in few words the naked-eye appearance of the stools and the results of bacterial examination.

H. Harold Scott.

Lopez (V. J.). **Gastro-Enteritis in Alipuram Jail, Bellary.**—*Indian Med. Gaz.* 1926. Dec. Vol. 61. No. 12. pp. 590–593.

The Alipuram jail accommodated 4,000 to 6,000 Moplahs. On admission, their health was deplorably bad. Many were old men, and all had suffered hardship, privation and exposure during the Moplah rebellion of 1921. Hookworm infection was cent. per cent. Dysentery was rife. Among them have occurred many cases of "gastro-enteritis," this last term being used for a malignant form of dysentery resembling cholera which did not manifest itself in epidemic form till November 1923. This type is not common in other Indian jails except where Moplahs are interned. In the Alipuram jail Shiga's bacillus was the causative organism in this fulminating type. The Moplah thus appears to harbour Shiga—which must therefore be

common in Malabar. CUNNINGHAM and KING'S investigation in jails of Bengal and Eastern Bengal revealed fulminating dysentery to be rare and that bacillary dysentery (79 per cent. Flexner) was much commoner than amoebic.

The sanitary arrangements in Alipuram jail are all that could be desired, fly nuisance practically nil. The Jewell filtered and chlorinated water was highly alkaline and contained excess of soluble sulphates—it may have caused gastro-intestinal trouble. Change of water supply has been followed by no regular epidemics of "gastro-enteritis," although the disease has not disappeared. Meteorological conditions, different (and colder) from those in Malabar, may be a predisposing factor. The possibility of infection of food supply is negligible. Systematic and continual search for "carriers" and latent cases among all the convicts is carefully carried out. This has been in vogue for four years; yet at every fresh examination a few cases of latent dysentery previously undetected are found. The conclusion is that cases of latent dysentery do not always exhibit signs. All convicts and warders who are cooks and food-handlers, and on water duties, are systematically examined and proved not to be carriers of organisms of the dysentery and enteric groups.

Onset of the illness is fairly sudden, beginning with diarrhoea and vomiting. Stools soon become watery with immense amounts of mucus, with or without blood. Fever of varying degrees. Extreme toxaemia and early collapse irrespective of number of stools and vomit. Cramp is not constant. In fatal cases death generally takes place within the first 24 hours of onset. After this critical period improvement though slow is steady.

Lister Institute multivalent antidysenteric serum gave disappointing results, due perhaps to the fact that this is not a primary disease, but an acute exacerbation of a chronic ulceration of bowel with necrosis. Cresol and essential oils tried in a few cases gave ambiguous results. [No mention is made of any attempt to improve individual resistance by lowering the cent. per cent. hookworm infection. The author notes that "the ravages of this disease [hookworm] had evidently caused irremediable impairment of health in some cases."]

H. M. H.

KOOPMANN (Hans) & KRÜGER (Emilie). Ueber die "chronische Ruhr." [**Chronic Dysentery.**]—*Med. Klin.* 1926. Dec. 24. Vol. 22. No. 52 (1150). pp. 1993–1996. [22 refs.]

The authors' investigation leads them to the conclusion that:—

(1) Chronic dysentery (type Y) is very widespread. It is common in tuberculous adolescents. Its infectiousness, though proven, is not of a high degree.

(2) The Widal reaction is reliable for diagnosis of "chronic dysentery."

(3) The gut diverticula, gall bladder, pancreas and appendix are sites specially selected by the dysentery bacilli, in which they remain latent and hidden for long periods.

(4) Chronic dysentery infection is a relatively mild disease, readily amenable to treatment, though occasionally resistant.

(5) Without doubt the best treatment is that of WAHL—oral administration of Yoghurt preparation.

H. M. H.

HURST (Arthur F.). **A Discussion on the Diagnosis and Treatment of Colitis. (The Opening Paper in a Discussion on Colitis at the Medical Section of the Royal Society of Medicine, on Nov. 23rd, 1926.)**—*Lancet.* 1926. Dec. 4. pp. 1151–1154. [14 refs.] Also in *Proc. Roy. Soc. Med.* 1927. Feb. Vol. 20. No. 4. pp. 367–375 (Sect. of Med. pp. 1–9). [Discussion by THURSFIELD (H.), DUDGEON (L. S.), RYLE (J. A.), ABRAHAMS (A.) & others, pp. 375–380 (Sect. of Med. pp. 9–14.)]

" No diagnosis is made more frequently and with less justification " than colitis. The diagnosis should not be made " until a thorough investigation has shown that inflammation of the colon—nothing less and nothing more—is present." In the course of this interesting paper the author makes it clear that such thorough investigation means sigmoidoscopy. If mucous membrane of rectum and pelvic colon is quite healthy, ulcerative colitis can be excluded. If blood and pus be passed by a patient with healthy rectum and pelvic colon, a growth of colon is almost certainly present ; if within 12 inches of anus it can be recognized by the sigmoidoscope. The author doubts if any severe colitis exists apart from the specific forms caused by infection with the *Amoeba histolytica* and *B. dysenteriae*, and " *sporadic ulcerative colitis* " ; his own experience makes this last identical with that of *B. dysenteriae*, except that in no case has he, or his bacteriological colleagues, obtained a dysentery bacillus from stools or mucus taken directly per sigmoidoscope, from the ulcers. Nor has any of these patients' blood agglutinated any of the known strains of *B. dysenteriae*. In long standing cases failure of treatment may be due to stricture ; and X-ray examination is of value only in this type of case. In other types it provides at best only information readily available by other methods. The autopsy records of the London hospitals for the 25 years ending in 1908 did not contain one example of stricture following ulcerative colitis. However, the author has watched this develop in four cases, and in three other cases polypi develop as the ulceration healed. Polypi tend to become malignant. An intermediate stage of polyposis probably had preceded the actual development of cancer of rectum, following chronic dysentery in two cases, and of the colon in one other. In sporadic ulcerative colitis treatment is on general lines —rest in bed, dieting, and lavage of colon. Since 1919 the author has obtained, on the whole, excellent results from polyvalent antidysenteric serum injected intravenously in large doses—40, 60, 80, 100 cc. on successive days and then 100 cc. for a few additional days. Appendicostomy had not given beneficial results.

Discussion.—Dr. Hugh THURSFIELD had for several years given antidysenteric serum, at once, to children suffering from severe diarrhoea. In a fair proportion subsequent bacteriological investigation demonstrated some type of dysentery organism. He was sure this practice had saved many infant lives.

Professor L. S. DUDGEON recognized 3 forms of ulcerative colitis due to ; (1) *E. histolytica* ; (2) Bacillus Shiga and Flexner ; (3) one in which no causative organism has been found. These last patients had not been abroad. He had been unable to cultivate a true dysentery bacillus from scrapings of ulcers (per sigmoidoscope) though in some cases such procedure had demonstrated *E. histolytica* which numerous faeces examinations had not revealed. The only microbes he had found, which appeared related to the intestinal ulceration, were haemolytic strains of *Bacillus coli* and *Bacillus mucus*

capsulatus. Two ulcerative colitis patients, who had never been abroad, showed high serum agglutinin content for B. Shiga, although that bacillus was not isolated from their faeces. He recognized three forms of polypoid growths in colon complicating bacillary dysentery and ulcerative colitis, (1) simple adenomata, (2) the same in conjunction with carcinomata, and (3) infective granulomata which might be partially or completely covered by mucosa.

Dr. J. A. Ryle confirmed Hurst's claims in use of both sigmoidoscope and polyvalent antidysenteric serum in ulcerative colitis. In 3 cases laboratory had failed to find amoebae or cysts, but sigmoidoscopy revealed characteristic amoebic ulcers. Recovery followed on emetine therapy.

Dr. Adolphe Abrahams had observed no benefit at all from antidysenteric serum; perhaps he had given too small doses.

Dr. Hurst, in reply, welcomed the support for his view that ulcerative colitis was an aberrant form of bacillary dysentery.

H. M. H.

Schur (Heinrich). Das Emetinum hydrochloricum in der Behandlung der Colitis ulcerosa. [**Emetine in the Treatment of Ulcerative Colitis.**]—*Wien. Klin. Woch.* 1927. Feb. 10. Vol. 40. No. 6. p. 188.

The author stresses his almost unfailing good results from emetine therapy in ulcerative colitis. These cases, in which dysentery bacilli cannot be isolated, are in fact amoebic, though amoebae may not always be demonstrated. The proof of this is the beneficial results from emetine treatment. He gives emetine in small doses—0·02 gramme three times daily—subcutaneously. In this dosage no toxic or harmful results have been detected. These emetine injections, however, must be combined with daily colonic irrigations, using mild astringents.

H. M. H.

Weiss. Ueber Carbo medicinalis "Merck" bei chronischer Ruhr. [**Carbo Medicinalis in Chronic Dysentery.**]—*Med. Klin.* 1927. Feb. 11. Vol. 23. No. 6 (1157). pp. 216–217.

The unsatisfactory results of the treatment of chronic amoebic or bacillary dysentery are well known to tropical practitioners and ships' surgeons. Relapses are frequent and bring in their train a group of neurasthenic symptoms. The author had under his care a patient with the characteristic syndrome of three-year-long dysentery (amoebic or bacillary). An injection of anti-dysentery serum had produced severe serum disease (anaphylaxis); twenty-seven years before this the patient had received an injection of anti-diphtheritic serum! As many drugs—notably emetine and yatren—had already been tried, the author treated the case with carbo-medicinalis "Merck," with rapid relief of symptoms and recovery of good health. The author urges that this charcoal preparation should form part of the materia medica of stores of all ships in the tropics; and that it should be given a trial in chronic dysentery cases.

H. M. H.

Doré (G. R.). Enterorrhagies répétées rebelles guéries par une injection unique de novarsénobenzol. [**Intractable Enterorrhagia cured by a Single Injection of Novarsenobenzol.**]—*Bull. Soc. Path. Exot.* 1926. Dec. 8. Vol. 19. No. 10. pp. 903–905.

An Annamese soldier suffered from repeated passages of blood per rectum during many weeks. A great variety of dieting, rectal lavages, intravenous and subcutaneous injections of emetine, intravenous injections of calcium, etc., failed to control the almost daily haemorrhages. The blood and cerebro-spinal fluid were always found to be Wassermann negative; no entozoal or protozoal parasites were ever found in the stools. Blood culture always negative. X-ray revealed perfectly normal intestines. Rectoscopy showed only a small superficial ulcer on right rectal wall. A single injection of novarsenobenzol 0·15 gm. intravenously was followed by disappearance of blood from stool and rapid recovery of weight and well being. A final rectoscopy revealed nothing abnormal.

H. M. H.

O'Connor (F. W.). **The Electrical Sigmoidoscope.**—*Proc. Assam Branch Brit. Med. Assoc. Annual Meeting Silchar, 1st and 2nd March, 1926.* pp. 19–22.

The author urges that the sigmoidoscope is an invaluable instrument in diagnosis, prognosis and treatment. It differentiates between amoebic and bacillary dysenteries. Periodical sigmoidoscopic examination is the only logical method to ensure proper treatment of bacillary and amoebic dysentery. Each produces characteristic lesions of the bowel. These claims are given illustration by descriptions of clinical cases of various types in which its use ensured accurate diagnosis, appropriate treatment, and a reasonably sure ground for ceasing treatment. Though in tea garden practice its use may be comparatively limited, yet it is indispensable for those who would accurately observe and treat bowel complaints in the tropics.

H. M. H.

Arnozan (X.). Un cas de lambliose. Traitement par l'*Hydrargyrum cum creta*. Guérison. [**A Case of Lambliasis treated by Hyd. c. Cret.**]—*Jl. Méd. de Bordeaux.* 1926. Nov. 25. Vol. 103. No. 20. p. 863.

A male infant, 20 months old, developed diarrhoea, which continued in spite of dieting. The child became enfeebled and 3 months later suddenly developed rigor, cyanosis, hyperpyrexia (rectal T. 41·5° C.), respirations 55 per minute, pulse 140, and sank into coma. After 24 hours recovery was almost as sudden. The stools were now found to contain many Lamblia cysts. Diarrhoea continued and 2 months later another but less severe pyrexial attack occurred, with many Lamblia in stools. The child was then given hydrargyrum cum creta, 10 cgm. daily for two days, then 5 cgm. daily for four days. Improvement was rapid and marked. After a month's interval hyd. cum cret. 10 cgm. was repeated daily for four days. Repeated examinations of stools during two months following revealed no Lamblia. The infant recovered perfect health and at 5 years of age was without ailment

and the stools were entirely free of Lamblia. In two other cases in adults of diarrhoea with Lamblia in stool, the author had found the Lamblia disappear after treatment with hyd. cum cret.

H. M. H.

Delanoë (P.). Un cas de dysenterie mixte à la fois amibienne et balantidienne contractée par un arabe à Mazagan. [**A Case of Dysentery, both Balantidial and Amoebic, in an Arab at Mazagan.**]—*Arch. Inst. Pasteur d'Algérie.* 1926. Mar. Vol. 4. No. 1. pp. 83–92. With 3 text figs. [4 refs.]

The much enfeebled and wasted patient presented the clinical signs of dysentery. Careful enquiry failed to elicit any contact with pig or pork. In the muco-sanguineous stools were numerous motile amoebae containing red blood corpuscles and many *Balantidium coli*. Not a few *Blastocystis hominis* were present also. The amoebae definitely disappeared after 4 grammes of stovarsol had been ingested—but neither stovarsol, ipicacuanha (Ravaut's paste), acetylarsan, novarsenobenzol, nor iodine and quinine bowel lavages, appeared to have any effect on the Balantidium. Five intravenous injections of stibyl 0·03 0·045 and 0·06 grammes at intervals of 2 to 3 days caused Balantidium to disappear. The patient died 7 days after leaving hospital. [No necropsy was (apparently) obtained]; the author does not claim that Balantidium had been definitely got rid of. He notes that balantidiasis in human beings, first recorded in North Africa in 1914, has been seldom reported there since.

H. M. H.

Ségal (J.). Un cas d'entéro-colite à *Balantidium coli*: traitement par le thymol et le thymol et le stovarsol: guérison. [**Case of Balantidiasis treated successfully by Thymol and Stovarsol.**]—*Rev. Méd. et Hyg. Trop.* 1926. Nov.–Dec. Vol. 18. No. 6. p. 176.

The patient had suffered for two years from muco-membranous and muco-sanguineous diarrhoea, with progressive loss of weight and inability to ingest any solid food. The stools contained numerous *Balantidium coli*. Thymol 3 grammes daily for three days followed by seven days stovarsol, 0·50 grammes daily, procured rapid disappearance of Balantidium from stools and progressive gain in weight and well-being. Three months later patient was quite well and there had been no relapse. [Presumably this occurred in France.]

H. M. H.

Brug (S. L.). Een geval van Infectie met *Balantidium coli*. [**A Case of *Balantidium coli* Infection.**]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1926. Vol. 66. No. 5. pp. 589–590.

A case of balantidiasis in an Amboinese soldier, in which it was doubtful whether the parasites were responsible for the occasional attacks of diarrhoea. The parasites were absent from normal stools, but appeared in the diarrhœic evacuations after a laxative. There

was never any blood in the faeces. A course of santonin (25 mgm. with 50 mgm. calomel twice a day for 3 days) permanently cured the infection. It appears that balantidiasis is not necessarily a serious affection.

W. J. Bais.

Saisawa (Kozo) & Tanabe (Bunshiro). Notes on the Healthy Carriers of Dysentery Bacilli.—*Far Eastern Assoc. Trop. Med. Trans. Sixth Biennial Congress, Tokyo, 1925.* Vol. 2. pp. 445–455.

Ségal (J.). Sur un cas d'hépatite amibienne autochtone.—*Rev. Méd. et Hyg. Trop.* 1926. Nov.–Dec. Vol. 18. No. 6. p. 177.

Thomson (Margaret Dora). Experimental Amoebiasis in the Rabbit.—*Univ. California Public Zool.* 1926. June 23. Vol. 29. No. 2. pp. 9–23. With 5 text figs. [24 refs.]

SPRUE.

BAUMGARTNER (E. A.) & SMITH (Glenn D.). **The *Monilia psilosis* as a Cause of Tropical Sprue.**—*Amer. Jl. Trop. Med.* 1926. Nov. Vol. 6. No. 6. pp. 433–441. [17 refs.]

In a series of eleven cases of sprue studied from the bacteriological standpoint, *Monilia psilosis* was found frequently in the faeces of every one. Ulcers from the mouth also gave positive cultures twice in the same patient. In blood cultures a negative result was obtained, but a yeast was obtained in two which did not give the typical sugar reactions of the true *Monilia psilosis*. The cases were derived from China, India, Korea, Porto Rico and the Philippines. These same monilia have been isolated from a few other conditions, and also from the stools of true pernicious anaemia in four out of seventeen cases. The authors feel sure from the evidence before them that the monilia is more than a secondary invader and think that their findings in this series constitute additional evidence of the etiological relationship of this organism to sprue.

P. H. Manson-Bahr.

ELDERS (C.). Spruw en pernicieuse anaemie in verband met deficientie. [**Sprue and Pernicious Anemia in Connexion with Deficiency.**]—*Geneesk Gids.* 1926. Nov. 19. Vol. 4. No. 47. pp. 1109–1112. [8 refs.]

The views of Elders, who considers sprue as a deficiency disease (lack of animal proteins and vitamins in general), have been referred to previously (see this *Bulletin*, Vol. 21, p. 705). From the similarity of sprue and pernicious anaemia he concluded that this disease had the same etiology. He now draws attention to papers which lately have provided support to his theory. Hamilton FAIRLEY and MACKIE (this *Bulletin*, Vol. 23, p. 795) assert that dietetic treatment alone will cure sprue and deny the etiological significance of *Monilia Ashfordi*, which like other Monilias is a saprophyte in the acid faeces of sprue patients. MINOT and MURPHY (*Jl. Am. Med. Assoc.*, 1926, Vol. 87, No. 7) report very good results in cases of pernicious anaemia by treatment with a diet similar to that which Elders recommended in sprue, and KOESSLER, MAURER and LOUGHLIN (*loc. cit.*) produce experimental evidence that lack of vitamins in rats causes an abnormal permeability of the intestinal wall for toxins producing anaemia.

Elders finds confirmation of his theory in these articles.

W. J. Bais.

COWEN (S. O.). **Pernicious Anaemia or Sprue.**—*Med. Jl. Australia.* 1926. Dec. 4. 13th Year. Vol. 2. No. 23. pp. 769–771. With 1 chart in text. [11 refs.]

This is an account of the clinical history of a patient—a lady, aged 65—in whom the diagnosis was pernicious anaemia and sprue. As the patient had lived in India some twelve years previously, the suspicion that she might have the latter disease had some foundation. The differential diagnosis of the two anaemias is discussed at some length without adducing any new facts. The Price-Jones cell measurement

curve differed little from the normal. Though the patient suffered from glossitis and buccal ulceration, no details of faeces examination are given and it is concluded that the author was really dealing with an instance of pernicious anaemia of the aplastic type.

P. H. M–B.

WARD (Gordon). **Sprue and Addisonian Anaemia.**—*Lancet.* 1926. Aug. 21. p. 408.

A note in which attention is drawn to the paper by NEWHAM and MORRIS (see this *Bulletin*, Vol. 23, p. 797). The glossitis and gastro-intestinal symptoms of addisonian anaemia are not necessarily dependent on the primary anaemia, but may be produced by haemolysis in the portal area. Ward does not agree that the oral administration of arsenic in sprue is harmful; he has observed great benefit from it in the anaemia of that disease.

P. H. M–B.

MORRIS (R. M.). **Some Observations on Urobilin Output in Sprue.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1926. Nov. 25. Vol. 20. No. 4. pp. 290–302. [16 refs.]

In sprue the study of urobilin is two-fold. Firstly, the characteristic colour of the freshly-voided faeces excites interest in the stool-pigments; secondly, its presence in the urine is important on account of the anaemia which may accompany this disease. Urobilin itself is a labile substance; hence from a chemical standpoint there may be several varieties. The main tests are JAFFE'S fluorescent zinc test and the characteristic absorption band in the green-blue zone of the spectrum. The relationship of urobilinogen to urobilin may be shown as follows. Bilirubin → urobilin ·–→ urobilinogen. For the last the main test is Ehrlich's aldehyde reaction. As a routine, this reaction was performed on a 24-hour specimen of urine; and a portion of the total quantity of faeces passed by the patient was examined daily for seven days. The amount of urobilinogen present is estimated by TERWEN'S colorimetric method. The details of procedure in both urine and faeces are given: in the former the amount of urobilin, in the latter that of *urobilinogen*, expressed as *urobilin*, is estimated. The figures obtained from a study of individual sprue cases would seem to show that the ratio of urobilinogen to urobilin is very high in sprue, and that the actual amount is much increased in those cases with anaemia. It is stated that leucobilin —or leuko-urobilin, which was described as the colourless pigment of the sprue stool, is synonymous with urobilinogen. The change of colour of the stool when exposed to light is due to the oxidation of urobilinogen to urobilin. The percentage of the total products present as urobilinogen varied from 68·91·75, while in a control surgical case it was 42·2. The relation of the urobilin output to the blood breakdown can be estimated by a series of calculations. The normal amount of urobilin excreted per diem is 150 mgm. derived from 153 mgm. of haematin, and it can be calculated that all the haematin in the body can be destroyed in about 140 days. In three sprue cases analysed in this manner it was estimated that blood was being used from 1·4–4·9 times as rapidly as in a normal man.

P. H. M–B.

Thaysen (Th. E. Hess). Die nichttropische Sprue. [**Non-tropical Sprue.**]—*Klin. Woch.* 1926. Nov. 12. Vol. 5. No. 46. pp. 2168–2172. [1 ref.]

In 1922 the author investigated a case of sprue in a man who had never travelled outside Europe and in the course of the next three years saw three others, all residents of Denmark. Non-tropical sprue cannot be differentiated from the type disease. Having encountered now five cases in all he is of the opinion that the disease is very widespread and many cases are mistaken for pancreatitis or other affections of that organ. The symptomatology resembles very closely that of the tropical form. It usually occurs in patients who have suffered from chronic diarrhoea for years. The early morning diarrhoea and the initial bilious diarrhoea, the loss of weight in non-tropical cases were every bit as striking as in the classical disease (one patient had lost 60 lbs. altogether) ; the shrinkage of the liver dullness and the obvious meteorism were the same. In two cases acute glossitis with aphthae was apparent ; in the others it appears to have been less striking. In two also there was an accompanying anaemia of the pernicious type. The proportion of fat in the faeces was as high as 44 per cent. Non-tropical sprue runs the same prolonged course. One patient had suffered from symptoms for 19, another for 6 years. Treatment with fruit and raw meat gave better results than milk alone. For the neutralization of the acidity of the faeces calcium carbonate and calcium phosphate proved most useful.

P. H. M–B.

Shepard (Charles A.) & Fleming (Wm. D.). **Sprue treated by Calcium Lactate and Parathyroid Extract. Report of Four Cases.**—*Amer. Jl. Trop. Med.* 1926. Nov. Vol. 6. No. 6. pp. 443–450. [6 refs.]

Without entering into the question of etiology, the authors note that *Monilia psilosis* was found by culture once only in four cases. They do not consider that as an addition to the calcium parathyroid therapy the question of diet has been given sufficient emphasis by Scott. The effect of starch or sugar in the diet suggests that in part the symptoms arise from fermentative processes in the intestinal tract. In the four cases of sprue reported, three were cured and the fourth greatly improved by the administration of calcium lactate with parathyroid extract, together with a diet, limited at first to milk, and later with the avoidance of excess of sugar, starch and fat The stomatitis was cured by the local application of arsphenamine.

P. H. M–B.

Cambessédès (H.). A propos d'un cas de séquelle de sprue. (Le régime dans la sprue.) [**A Case of Recurring Sprue. Regime of Treatment.**] *Rev. Méd. et Hyg. Trop.* 1926. Nov.–Dec. Vol. 18. No. 6. pp. 161–164.

This is a lengthy account of a single case of sprue which, originating in that well-known endemic focus of the disease—Bombay, was treated with some success there in 1924 on a diet of milk and oranges. A relapse recurring in France in February 1925, the dietary was completely recast, milk being eliminated and full doses of pancreatin being exhibited. Great improvement is said to have taken place, although no details are given.

P. H. M-B.

MEDICAL ZOOLOGY.

Faust (Ernest Carroll). **Parasitic Infections and Human Disease in China.**—*Arch. Path. & Lab. Med.* Chicago. 1926. Aug. Vol. 2. No. 2. pp. 223–240. With 1 map. [50 refs.]

This is a valuable digest of the parasites and parasitic diseases of man in China; it does not contain any new observations of fact, but is a comprehensive collection of scattered facts carefully analysed and systematically united. The prologue contains a description of the main physiographical features of the country, a discussion on the interrelations of parasite and intermediary or reservoir hosts and man, and a brief statement of native economic circumstances that conduce to the distribution of parasites and spread of parasitic diseases. In a concluding generalization the author distinguishes in his survey five noso-geographical areas in the Far East—a tropical oriental, a subtropical oriental, an intermediate (between oriental and palaearctic), a palaearctic, and a dry palaearctic (for the arid plains of north-western China and Mongolia). In the body of the paper the parasitic diseases and parasites of man in China are catalogued in parasitological order, with, in each case, relevant notice of the biology, pathology, and areas of incidence. The noso-geographical division of the country, showing the distribution of parasitic diseases, has been found useful in hospital diagnosis.

A. Alcock.

Deschiens (R.). Comment dépister les infections parasitaires du tube digestif. [**How to hunt for Intestinal Parasites (in Stools).**]—*Presse Méd.* 1927. Jan. 1. Vol. 35. No. 1. pp. 3–4. [2 refs.]

Since there are periods when intestinal parasites, although present, are not being passed—particularly in the case of Giardia infestations—a series of stools must be examined during at least 8 successive days. The patient should be provided with 8 tubes and some 5 per cent. solution of formol, and directed to preserve a specimen of his daily stool in a separate tube for 8 successive days, using some of the formol in each case as a preservative, and to deliver the whole collection to the physician on the 9th day. To each tube should be attached a ticket with the patient's name and the date of collection. The specimens can then be examined individually, or mixed, washed and purified by levitation, and centrifugated.

A. A.

Becker (Elery R.). **Detection of Intestinal Protozoan Infections by the Cultivation Method.**—*Jl. Parasit.* 1926. June. Vol. 12. No. 4. pp. 219–220. [2 refs.]

The author, from examination of faeces of 110 patients in a mental hospital in New Jersey, concludes that for the detection of *Trichomonas hominis* the culture method is better than the smear method, but that for *Chilomastix mesnili* the culture method should be supplemented by the smear method. The only unusual observation about the other intestinal protozoa noted is the abnormally high percentage (36·8) of *Entamoeba coli* cysts.

A. A.

Tochihara (Isamu). **Studies on Intestinal Protozoa.**—*Far Eastern Assoc. Trop. Med. Trans. Sixth Biennial Congress, Tokyo, 1925.* Vol. 2. pp. 231–232.

The author has made a single examination in each instance of the stool from 103 Japanese soldiers and 454 Japanese agriculturals for intestinal Protozoa, and has found infestation both heavier and more diversified in the agriculturals. Of 124 of the latter he made a further examination in each instance six-times repeated, and the following are his findings in this more searching series: Infestations with *Entamoeba coli*, 54 per cent.; with *E. nana*, 62·0; with *Dientamoeba fragilis*, 41·1; with *Iodamoeba williamsi*, 9·7; with *Giardia intestinalis*, 4·8; with *Chilomastix mesnili*, 0·8; with undetermined flagellates, 3·2.

A. A.

Theiler (A.) & du Toit (P. J.). La transmission des maladies, dont les tiques sont les vecteurs, par l'injection intrajugulaire d'une émulsion de l'hôte intermédiaire. [**The Transmission of Tick-Conveyed Diseases by Intrajugular Injection of Tick Emulsion.**]—*Bull. Soc. Path. Exot.* 1926. Oct. 13. Vol. 19. No. 8. pp. 725–737.

The conclusions of the controlled experiments here recorded are that the Rickettsia of heart-water can be transmitted to susceptible animals by intrajugular injection of an emulsion of infected nymphs of *Amblyomma hebraeum*. Also that the *Theileria parva* of East Coast fever can be transmitted by intrajugular injection of an emulsion of infected adults or nymphs of *Rhipicephalus appendiculatus* that have had an infective feed of 72 to 120 hours' (a mean of 96 hours') duration.

A. A.

Metalnikov (S.). Contribution à l'étude de l'immunité chez les invertébrés. [**Immunity in the Invertebrata.**]—*Ann. Inst. Pasteur.* 1926. Sept. Vol. 40. No. 9. pp. 787–826. With 9 text figs. [Refs. in footnotes.]

The argument of this paper is based more on ingenious ratiocination, mostly from some generally-accepted truths, than on any very novel experimental data. In his large conception of immunity the author distinguishes: (1) The immunity acquired by an organism in its gradual adaptation to an uncongenial medium, a chemical poison, or a bacterial toxin—which he defines as "immunity of adaptation" by abated cell sensibility; (2) the immunity to microbes (and to alien albuminoid substances) acquired by an organism as a result of the active resistance of its cells—both leucocytes and fixed tissue-cells—which he defines as "active immunity" of defence by exalted cell-sensibility; and (3) the reactions manifested by an organism to uncongenial elements in the medium—which he designates "passive immunity" (of defence by heightened cell-sensibility). Reflex excitation of tears and mucus and other secretions, sneezing and coughing and intestinal spasm, the refusal of particles of carmine by an Infusorian that has learnt by experience that carmine is indigestible, the employment of its nettle-cells by a polyp—all these, as instances of defence by a sort of passive or instinctive super-sensibility, are included in his general conception of immunity.

To understand immunity, he says, study must be made of the defensive reactions of all the different cells of the organism, as well as the influence of particular organs, of humours, and of the nervous system.

Among invertebrates as among vertebrates microbes are overcome by phagocytosis (by leucocytes of divers kinds and by fixed tissue-cells) and, more rarely, by bacteriolysis ; by enshroudment and encapsulation in giant cells ; and by elimination in pus and other excretions. There appears to be no difference in principle between invertebrates and vertebrates in these respects, except that " passive immunity " and " immunity of adaptation " are more predominant in invertebrates.

A. A.

Hegner (Robert W.). **The Biology of Host-Parasite Relationships among Protozoa living in Man.**—*Quarterly Rev. Biol.* 1926. July. Vol. 1. No. 3. pp. 393–418. With 1 text fig. & 3 plates. [64 refs.]

——. **Host-Parasite Relationships among Human Protozoa.**—*Proc. Roy. Soc. Med.* (Sect. of Trop. Dis. & Parasit.) 1926. Sept. Vol. 19. No. 11. pp. 41–44.

These two papers cover the same ground—a familiar ground—and the second is an outline and abstract of the first, plus a few remarks upon the rational basis of prevention and control. The protozoa that live and move in man are enumerated and classed according to their field of action, and their natural history is followed out, the analysis including ways and means of invasion, course and spread of infection in the host, reactions and adjustments of host, effects on host, ways of escape from host, and specific reciprocity of host and parasite.

It is rather strong meat for the novice ; its sweetness is for the man who has time to think.

A. A.

Hegner (R. W.). **The Transmission of Human Protozoa.**—*Science.* 1926. July 9. Vol. 64. No. 1645. pp. 28–34. [24 refs.]

This paper, which is a conspectus of the Protozoa that attack the human body, is an abstract of three lectures delivered by the author at the London School of Tropical Medicine in 1926. The species are set in three squadrons, as they attack severally the intestine, blood, and solid tissues. Of the species of the last sort Sarcocystis alone is mentioned, the significant invasions of the visceral tissues by species of the other two sorts being shut out of the scheme.

A. A.

Sergent (Edm.), Parrot (L.), Donatien (A.) & Lestoquard (F.). Prémunition et protozooses sanguines. [**Premunition and Blood Protozoiasis.**]—*Bull. Soc. Path. Exot.* 1926. July 7. Vol. 19. No. 7. pp. 532–536. [10 refs.]

The authors define " premunition " as the state of tolerance or immunity to a *fresh* infection which exists after an individual has passed through an acute febrile phase of that particular infection into a chronic [latent] phase that is consistent with sound health ; a good and common example of " premunition " is afforded by birds that have recovered

from an acute invasion of *Plasmodium relictum* but for a long time afterwards retain the latent infection and are resistant to a fresh infection.

In course of time—months or years, according to the species of infection—a specific premunition : (*a*) may pass on to a true immunity, as in bacteria infections ; (*b*) but more often it wears out and the long " premune " individual again becomes susceptible to the specific infection, and *Plasmodium relictum* is a good example of this commoner alternative (*c*) a third possibility has come under the authors' observation—susceptible calves inoculated with a strain of *Piroplasma bigeminum* may attain " premunition " without the intervention of a febrile stage worthy of notice, this phenomenon being comparable with NICOLLE'S " inapparent typhus " (see this *Bulletin*, Vol. 22, p. 975).

The authors remark the diagnostic and preventive aspects of " premunition "—the latter aspects particularly in the case of malarial fevers. In the fact that colonial-bred Europeans [Eurasians and Eurafricans] and Europeans long-resident in malarious countries display, compared with new arrivals from Europe, a certain show of resistance to malaria they are inclined to see a congruity with " premunition " ; and from this point of view they suggest a diversity of interesting questions, among them the question whether or not it is better for a recent malaria patient, who has perforce to remain in an unhealthy country, to be promptly " sterilized " of his malaria, or merely to be treated for his acute attack and left with a " premunizing " latent infection. The subject is one, the authors remark, that may be commended to those who have to do with the malaria treatment of general paralytics.

A. A.

DOGIEL (V.) & FEDOROWA (T.). **The Action of Carbon Monoxide on Certain Blood Protozoa.**—*Ann. Trop. Med. & Parasit.* 19/6. Aug. 13. Vol. 20. No. 3. pp. 267–272.

The authors think : (1) That since certain Protozoan parasites select the red blood corpuscles of vertebrates for their abode, it may reasonably be assumed that these parasites are in constant need of oxygen ; (2) that a reduction in the oxygen-content of the red blood corpuscles may reasonably therefore be assumed to be harmful to the said parasites ; and (3) that the foregoing assumptions are worth testing by experiment—with a view to possibilities of practical application if they should prove well founded. The authors' experimental method of reducing the oxygen of the red blood corpuscles was the heroic one of administering carbon monoxide by inhalation.

Lizards (*Lacerta vivipara*) infested with a Haemogregarine (Caryolysus) were, by simple methods described, exposed to an atmosphere containing an excess of CO—these reptiles having been found capable of withstanding for a long time an atmosphere containing 7 per cent. of that gas without being poisoned. The individual lizards underwent repeated exposure, being left in CO-polluted atmosphere until symptoms of suffocation appeared, then removed and allowed to recover, and then again subjected to the treatment. Of 5 lizards used 1 succumbed (from " unknown causes "), but in the 4 survivors the numbers of merozoites in the red blood corpuslces were greatly reduced after the treatment. Similar experiments were made with a bird

(*Padda orizivora*) infected with Haemoproteus; it succumbed at the end of a series of 7 experiments, but no reduction of parasites was observed in its red blood corpuscles.

A. A.

Gray (George A.). **Mercurochrome in the Treatment of Intestinal Protozoan Infections: Final Report.**—*Southern Med. Jl.* 1926. Nov. Vol. 19. No. 11. pp. 780–782. [5 refs.]

The author observing of mercurochrome that in addition to having good germicidal powers, it is penetrating and does not precipitate protein nor irritate the kidneys, and having also observed that when given *intra venis* it was eliminated largely by the bowel, conceived it to be well adapted for use in chronic infestations of intestinal protozoa. He here gives the results of his experience of it for this purpose —administered in capsules, *per os*, of ½ to 3 grains, 1 to 4 (preferably 3) times daily, for a term (if possible) of 2 or 3 weeks. It sometimes causes intestinal cramps and nausea, and (when continued) slight stomatitis, and it gives the stools an alarming mahogany or brick-red colour for which the patient should be prepared and indeed be encouraged to expect and to maintain. Systematic examinations, repeated at intervals of 3 to 6 or even 12 months, of stools of patients who had undergone the treatment, gave the following results: Giardia, 20 cases, 16 negative for parasites; Chilomastix, 22 cases, 12 negative; *Entamoeba "dysenterica,"* 13 cases, 5 negative; "Councilmania" 10 cases, 2 negative.

A. A.

Shortt (H. E.). **Note on Cytoplasmic Counter-Staining with Special Reference to Protozoological Technique.**—*Indian Jl. Med. Res.* 1927. Jan. Vol. 14. No. 3. pp. 565–566.

In differential staining, to avoid the attenuation of the counter-stain in the processes of washing and subsequent gradual dehydration through a series of diluted alcohols, the author recommends the use as a solvent for the dye employed as a counter-stain, not water, but some fluid that, besides being an efficient solvent of the dye can be followed directly by the final clearing agent, such as xylol, in which the dye is insoluble. The fluid that answers these requirements is here said to be Weigert's carbol-xylol (1 part pure carbolic acid and 3 parts xylol), where the carbolic acid besides being an effective solvent of the dye has the additional property of extracting any traces of water. From this fluid the tissue can be taken straightway into xylol, for mounting in balsam. "The procedure is eminently satisfactory for almost any staining . . . where separate nuclear and cytoplasmic stains are indicated."

A. A.

Patton (W. S.) & Hindle (Edward). **Notes on Three New Parasites of the Striped Hamster** (*Cricetulus griseus*). - *Proc. Roy. Soc.* 1926. Oct. 1. Ser. B. Vol. 100. No. B 704. pp. 387–390. With 2 text figs. [1 ref.]

The (Protozoon) parasites here described are a Trypanosoma; a Grahamella, in the red cells; and a Sarcocystis, in the muscles of the back and pharynx. All are considered to be new species and are named after their host. The authors remark that *Cricetulus griseus* is remarkably free

from ectoparasites, since in the course of examining more than 800 of these hamsters they have noticed them only on three occasions. Once, on an emaciated animal, they met with a large number of lice (Haematopinus), and once a single flea (Ceratophyllus) was caught on one animal and seen (but not caught) on another.

A. A.

Dios (Roberto L.), Zuccarini (J. A.) & Werngren (Elsa Tyre). Sobre la existencia de *Trypanosoma minasense* y *Microfilaria* sp. en monos. [*T. minasense* **and a Microfilaria in a Monkey.**]—*Rev. Inst. Bacteriológ.* Buenos Aires. 1925. Sept. Vol. 4. No. 2. pp. 176–181. With 7 figs. & 1 plate. [5 refs.]

The parasites here described were discovered in the blood of Cebid monkeys—*Callithrix pencillata*—from Paraguay. The trypanosome is identified with *T. minasense* of Chagas; it is a large form with a tapering, almost filamentous, posterior end and a kinetonucleus placed remarkably far forwards, and it appears to be non-pathogenous to its host. The Microfilaria, which is without a sheath, was very abundant in the peripheral blood.

A. A.

Brug (S. L.). *Nucleophaga intestinalis* **N.Sp. Parasitic in the Nucleus of** *Endolimax williamsi* **(Prow.)** (= *Jodamoeba bütschli* **(Prow.).**—*Meded. Dienst d. Volksgezondheid.* 1926. Pt. 4. pp. 466–468. [7 refs.]

———. **Sphaerita as a Parasite of** *Entamoeba coli.*—*Ibid.* pp. 469–470. With 26 figs. on 1 plate.

These papers contain illustrated descriptions of two very similar "coccoid" bodies. The first, *Nucleophaga intestinalis*, was found parasitic in the nucleus of *Iodamoeba bütschlii* (...*Endolimax williamsi*); it proliferates within the nucleus—which becomes enlarged and at last disappears altogether—and then it invades the cytoplasm; more than a hundred amoebae were found infected in one slide.

The second, a species of Sphaerita, was found proliferating in the cytoplasm of *Entamoeba coli*. The author remarks its "great similarity" to the first. "If the habitat were not different (in the protoplasm and in the nucleus respectively) the identity of both might be considered."

A. A.

Hegner (R. W.). **The Protozoa of the Pitcher-Plant,** *Sarracenia purpurea.*—*Biol. Bull.* 1926. Mar. Vol. 50. No. 3. pp. 271–276. [4 refs.]

The author has examined the fauna of ten pitchers of different plants of *Sarracenia purpurea* from different places in Maine and has found in them, collectively, several species representing all three Classes of free Protozoa—a living population. Struck by the phenomenon of a fauna of this sort accommodating itself to a liquid known to contain digestive ferments, the author introduced (under varying circumstances) Paramoecium, Colpoda, and Chilomonas into the pitchers and discovered that they too could live and multiply in the liquid.

A. A.

Covey (G. W.). [**Protozoan Infections of Bowel in Nebraska.**]—*Nebraska State Med. Jl.* 1926. June. Vol. 11. p. 220. [Summarized in *Jl. Amer. Med. Assoc.* 1926. Aug. 7. Vol. 87. No. 6. p. 441.]

Protozoon infestation of the intestine is believed to be increasing in Nebraska. Among cases observed most of the patients had never been out of the temperate zone. Six cases of infestation by *Entamoeba histolytica* are reported, two of which were directly fatal.

A. A.

Howitt (Beatrice F.). **The Effect of Certain Drugs and Dyes upon the Growth of** *Endamoeba gingivalis* **(Gros) in Vitro.**—*Univ. California Public. Zool.* 1926. Feb. 16. Vol. 28. No. 8. pp. 173–182. [14 refs.]

— —. **Experiments with** *Endamoeba gingivalis* **(Gros) in Mixed Bacterial Cultures; in Filtered Saliva; on a Solid Base; with Peritoneal Cells; and with Digestive Secretions.**—*Ibid.* No. 9. pp. 183–202. With 12 figs. on 2 plates. [7 refs.]

In respect of the experiments on the effect of drugs upon *Entamoeba gingivalis* it is stated, with reservations, that of the substances tested *in vitro* upon cultures of that organism: (1) Stovarsol is the most effective and yatren the least effective; (2) the arsenical are more toxic than the non-arsenical compounds; and (3) emetine hydrochloride is not specifically effective.

In respect of the experiments on the behaviour of *E. gingivalis* in cultures it is stated: (1) That the organism will thrive in the presence of filtered human saliva with a solid substrate of coagulated egg; also in Locke medium having a base of coagulated serum or of agar if the latter has not a too slippery surface; (2) that *E. gingivalis* ingests both erythrocytes and leucocytes of the guineapig, but preferably the former; and (3) that *in vitro* the organism cannot withstand human gastric juice containing the normal amount of HCl (but will survive in fluid deficient in or entirely lacking free HCl), and rapidly explodes in the presence of human bile.

A. A.

Child (Horace J.). **Studies on the Ingestion of Leucocytes, and on Mitosis, in** *Endamoeba gingivalis.*—*Univ. California. Public. Zoot.* 1926. Feb. 19. Vol. 28. No. 14. pp. 251–284. With 46 figs. on 5 plates & 9 text figs. [15 refs.]

This handsomely illustrated paper contains observations in abundant detail of *Entamoeba gingivalis* obtained from teeth in cases of pyorrhoea. It was observed that the food of this organism consists chiefly of salivary corpuscles and also, to a certain extent, of whole polymorphonuclear leucocytes. Several such leucocytes were observed sometimes to combine to form a giant cell enveloping an amoeba.

A. A.

Hill (Claire McDowell). **The Successful Application of the Culture Method to the Diagnosis of Intestinal Flagellates in the Field.**—*Amer. Jl. Hyg.* 1926. Sept. Vol. 6. No. 5. pp. 646–658. [5 refs.]

In examination of 912 samples of faeces for comparison between the two methods of detecting the two particular species of Protozoa the author's results were as follows, stated in percentage of cases:—

Smear method	5·7	*Chilomastix mesnili*;	1·7	*Trichomonas hominis.*	
Culture method	7·1	,, ,,	9·2	,,	,,
Combined methods,	9·4	,, ,,	9·2	,,	,,

Trophozoites of neither species were found in *smears* from stools more than 10 hours old; but positive *cultures* of both species were got from stools up to 32 hours old.

The culture-medium used was the Hogue modification of the ovomucoid medium (Hegner & Becker, *Journ. Parasit.*, 1922). The smears

(two) were stained in dilute eosin, followed by iodine if cysts had been observed. The culture method is considered feasible under field conditions.

A. A.

Guerricchio (Antonio). Anemia grave da *Trichomonas intestinalis*. [*Trichomonas hominis* **Anaemia.**]—*Riforma Med.* 1926. Nov. 29. Vol. 42. No. 48. pp. 1146–1147. [25 refs.]

After notice of numerous authors who have recorded their experience of intestinal flagellates in pathology, the writer describes in considerable detail a case of grave anaemia concurrent with, and concordant in its response to specific treatment for, chronic diarrhoea and a heavy infestation with *Trichomonas intestinalis*. The patient was a native Italian, age 48, who had suffered for about 20 months from profuse diarrhoea, abdominal pains, and other symptoms of gastro-intestinal disorder. On examination the most obvious signs of disease were intense pallor, and oedema of the legs. The number of red blood-corpuscles was reduced to 800,000 and of leucocytes to 2,000. The alkaline, semi-liquid stools contained only an extraordinary number of active flagellates. After preliminary treatment with emetine the case was treated first with stovarsol alone by mouth (50 cgm. daily) and afterwards with stovarsol alternately with injections of atoxyl. Within a fortnight the parasites became scarce and the patient's colour began to improve, and in the course of about 3 months the parasites had disappeared and the number of red blood-corpuscles had increased to 4,500,000, the leucocytes having increased to 8,000 some time before.

A. A.

Escomel (Edmundo). El primer caso de tricomonosis vesical descrito en el Perú. [**The First Record of Vesical Trichomoniasis in Peru.**]—*Cronica Méd.* Lima. 1926. July. Vol. 43. No. 757. pp. 185–189.

——. Un premier cas de trichomonose vésicale décrit au Pérou.—*Bull. Soc. Path. Exot.* 1926. Oct. 13. Vol. 19. No. 8. pp. 697–700.

In this case *Trichomonas vaginalis* was found not at all in the vagina but in the bladder, of a female diabetic, causing pyuria. A suspension of 30 drops of essence of turpentine in the yolk of an egg beaten up with water, with 10 drops of laudanum as a corrective, was injected into the bladder—how often is not stated—during 3 days, after which parasites could not be found.

A. A.

Deschiens (R.). Simplification du milieu de Boeck-Drbohlav pour la culture du *Trichomonas*. [**Simplification of the Boeck-Drbohlav Medium for Culture of Trichomonas.**]—*C.R. Soc. Biol.* 1927. Jan. 14. Vol. 96. No. 1. pp. 13–14.

The simplified medium here described is composed of 2 cc. of total egg (manipulated aseptically) coagulated in a sloped tube (at 75° C. for 2 hours) and then covered with 5 or 6 cc. of sterile physiological saline. In this the author has cultivated with ease (at 37° and 20° C.) 3 species of Trichomonas. The culture attains maximum richness

on the 3rd day ; and although the vitality continues for 6 to 7 days on an average, yet for further continuation in the face of certain oppugnant bacteria the medium should be re-seminated every 4 days.

A. A.

Schuurmann (C. J.) & Schuurmann ten Bohkel Stuinink (A.). Essais de culture pure de *Trichomonas intestinalis*. [**Attempts to cultivate *T. intestinalis* Pure.**]—*Ann. Inst. Pasteur.* 1927. Jan. Vol. 41. No. 1. pp. 62–71. [55 refs.]

The author gives an account of various (unsuccessful) methods by which he has attempted to purify cultures of Trichomonas, and comes to the conclusion that simple dilution of the medium is all that remains—and patience.

A. A.

Kessel (John F.). **Trichomoniasis in Kittens.**—*Proc. Soc. Experim. Biol. & Med.* 1926. Dec. Vol. 24. No. 3. pp. 200–202. [3 refs.]

Having satisfied himself by microscopic and cultural examination of their faeces that 69 kittens were " negative " in respect of Trichomonas, the author, working at the Peking Union Medical College, infected 26 of them with Trichomonas from man, from monkey, and from rat, with positive results in 10 out of 14, 2 out of 6, and 5 out of 6 cases, respectively. He also infected 6 of the " negative " kittens with a Trichomonas (morphologically identical with the *T. felis* of Cunha and Muniz as determined by Brumpt) obtained from the street kittens of Peking, with positive results in 5 instances. In all the positively infected kittens, in both series of experiments alike—as well as in naturally infected street kittens of Peking –the symptoms were acute liquid diarrhoea. The results shake the author's confidence in the specific distinction of *Trichomonas felis*.

A. A.

Parodi (Silvio E.) & Niño (Flavio L.). A propósito de la frecuencia del *Chilomastix mesnili* en las heces humanas. [**Presence of *Chilomastix mesnili* in Human Faeces.**]—*Semana Méd.* 1926. Dec. 9. Vol. 33. No. 49 (1717). pp. 1520–1522. [16 refs.]

The authors quote the findings of various investigators in different parts of the world and refer to their previous records. Parodi in 1917 found Chilomastix and Trichomonas in 5·33 per cent. of 150 women and in 2·66 per cent. of the same number of children ; Niño in 1926 reported 1·41 per cent. affected amongst 425 individuals.

They now record that out of 1,955 faecal examinations, carried out at the Central Labaratory of the Clinical Hospital, they have only twice found vegetative and cystic forms of *Chilomastix mesnili*, that is, in 0·102 per cent.

H. Harold Scott.

Boeck (William C.). **Giardiasis in Man. Its Prevalence and Relation to Diarrhea and to Gallbladder Disease.**—*Arch. Intern. Med.* 1927. Jan. 15. Vol. 39. No. 1. pp. 134–158. With 1 text fig. [57 refs.]

This is a review of the subject of Giardia infection and an argument against its pathogenous character. The author concludes from a

study of statistics that children are more often infected than adults and that neither in children nor adults does diarrhoea occur more often in infected than in not-infected individuals. The widespread belief that Giardia does cause diarrhoea he explains as either a mere assumption or a fallacious deduction, or else as a conclusion supported by evidence "either meagre and devoid of proper control measures or open to other and as logical interpretations"—evidence "at best quite inconclusive and demanding of more confirmatory observations." He himself once believed from a microscopic study of his own sections that *Giardia microti* caused chronic enteritis in the field mouse, but further study of more carefully fixed material has since led him to change his opinion. His adverse criticism of a mass of experimental and post-mortem evidence cannot be condensed profitably.

In respect of the belief that Giardia initiates or aggravates disease of the biliary apparatus the author is equally sceptical.

"Giardia up to the present time has been found in only one instance in the gallbladder removed at operation. While in children gallbladder disease is extremely rare, the rate of Giardia infection is two or three times as great as in adults in whom cholecystitis is comparatively frequent. Giardia infections occur infrequently in persons with disease of the gallbladder, which is, however, frequently a result of gastro-intestinal (bacterial) infection. The symptoms of cholecystitis are cleared up by cholecystectomy, but when associated with Giardia this organism may persist after operation. Giardia infections may occur in several members of the same family but cholecystitis does not occur in all of them and may never appear." The foregoing are the author's summarized arguments.

"There is no evidence of scientific value at present to support the theory of Barrow that *Giardia lamblia* is concerned in the aetiology of arthritis deformans, certain forms of neurasthenia, melancholia with loss of weight and such symptoms as nausea, vomiting, belching of gas and epigastric pain and tenderness."

[By some extraordinary mischance, which we hesitate to impute even to a compositor, the date (1681) of LEEUWENHOEK's letter making known his discovery of the intestinal Protozoa of man (*Bulletin*, Vol. 16, p. 89) is here given as 1861.]

A. A.

BAUMGARTNER (E. A.). **Giardia (Lamblia) Infestation of Man.**—*Clifton Med. Bull.* 1926. Sept. Vol. 12. No. 3. pp. 98–102. [8 refs.]

Infestation with Giardia was discovered in 42 of 6,715 patients included in the present survey. Among the forty-two, 27 had some gastro-intestinal complaint; 8 had diarrhoea; achylia or subacidity was not frequent; anaemia, as indicated both by proportion of red cells and by haemoglobin, was frequent; many had slight leucocytosis, but few had lymphocyte increase; 7 had disease of gall-bladder, but Giardia was not found in 2 that submitted to operation; and bile-drainages showed very few infected biles.

A. A.

GARIN (Giovanni). Lambliosi intestinale ed anemia con speciale riguardo alla forma grave e perniciosa. [**Lamblial Infection and Pernicious Anaemia.**]—*Riv. di Clin. Med.* 1926. Dec. 15. Vol. 27. No. 23. pp. 899–914. [21 refs.]

The author records the case of a man of 51 years who suffered from attacks of diarrhoea, pultaceous, semi-liquid stools, 4 to 10 daily,

with loss of weight, cachexia, and anaemia. When seen about a year after the onset, the red corpuscles were between 1½ and 2 million, leucocytes 4,000 per cmm., relative count normal; anisocytosis and poikilocytosis marked. The stools contained Giardia in large numbers and no cause for the anaemia being found, the anaemia is ascribed to the parasites. After 6–7 months' treatment the erythrocytes increased to 3,600,000, and leucocytes to 5,500 per cmm., but the diarrhoea never properly cleared up, nor did the flagellate disappear. Five months later the anaemia became aggravated again, and progressively worse, death ensuing 2½ years after the first onset.

Unfortunately, no post-mortem examination was made.

H. Harold Scott.

Carrere (J.). [**Lambliasis.**] —*An. Facul. de Med.* Montevideo. 1925. Dec. Vol. 10. p. 999. [Summarized in *Jl. Amer. Med. Assoc.* 1926. Aug. 7. Vol. 87. No. 6. pp. 447–448.]

The wide diversity of abdominal symptoms in Lamblia infestations is noted, and the good effect of an arsphenamine preparation in treatment.

A. A.

Greenway (Daniel). *Giardia canis* y *Giardia intestinalis*. [*Giardia canis* **and** *Giardia intestinalis*.]—*Prensa Méd. Argentina.* 1926. Dec. 30. Vol. 13. No. 21. pp. 704–706. [6 refs.]

The author discusses some of the points which have been adduced to regard the Giardia of the dog and other animals as a species different from that found in man. After quoting what various others have written, especially Wenyon, Deschiens, Fantham & Porter, Hegner & Taliaferro, and giving a table of measurements, he concludes that the morphological differences and the failure to obtain mutual infestation experimentally are not sufficient criteria for separation into two species.

H. Harold Scott.

Taliaferro (W. H.). **Variability and Inheritance of Size in** *Trypanosoma lewisi*.— *Jl. Experim. Zool.* 1926. Feb. Vol. 43. No. 3. pp. 429–473. With 12 text figs. [18 refs.]

The author signifies as the "adult" stage of *Trypanosoma lewisi* in the rat that phase, in the course of an individual infection, when the trypanosomes abound in the rat's blood without evidence of growth or fission. In this "adult" stage an individual trypanosome can be made the standard and starting-point of a "pure line," and from such a "pure line," established by the author the experimental studies in variation and heredity in *T. lewisi*, here described and discussed, have been carried on. Descriptions of such studies, however, are too mathematical in expression to be condensed or abstracted, so that we can here take note only of some of the author's propositions and conclusions.

1. Does growing the "pure line" in different rats result in significant difference in size? In three of seven subinoculated rats divergencies in mean size were too remarkable to be fortuitous.

2. Such passage of "pure line" from rat to rat, even in a long series, does not result in significant changes in the variability for size.

3. Passage of the " pure line " through the flea generally results in a very significant increase in variability for total length, but there is no greater effect on mean size than might be expected.

4. Does *T. lewisi* as it occurs in nature consist of many " pure lines." ? Of ten infections got from rats from various places only one showed the high variability characteristic of the pure line after passage through the flea.

A. A.

Rodhain (J.). *Herpetomonas rhinoestri*, sp. n., parasite des larves de *Rhinoestrus nivarletti* : Rodh. et Beq. [**New Species of Herpetomonas Parasitic in Larvae of** *Rhinoestrus nivarletti*.] *C. R. Soc. Biol.* 1926. Nov. 5. Vol. 95. No. 31. pp. 1124–1127. With 1 text fig. [3 refs.]

——. Le mode de transmission de *Herpetomonas rhinoestri* Rod. [*Means of Transmission of H. rhinoestri*.]— *Ibid.* pp. 1128–1130. [1 ref.]

Herpetomonas rhinoestri, here described and figured, is an intestinal parasite of the larva of *Rhinoestrus nivarletti* (of the Dipterous family Oestridae, or bot-flies), the said larva being in turn parasitic in the African river-hog (Potamochaerus). Since bot-fly larvae are strictly endoparasitic—the larvae of Rhinoestrus being deposited directly upon the mammalian host and since the parent bot-flies do not feed at all, it is not very obvious how the larvae become infected with intestinal flagellates. The author, attending to this question, finds actual evidence that the ovaries and developing eggs of the adult fly are infected with the Herpetomonas, and he thus accounts for the infection of the larva, by inheritance from the parent. As to the manner of infection of the parent, he assumes transmission in the ordinary course of development from larva to adult, Prowazek having already produced some evidence that *Herpetomonas sarcophagae* passes on from the larva to the adult stage of Sarcophaga.

The author draws attention to the suggestive implications of this interesting discovery, in the direction of the pupiparous flies.

A. A.

da Fonseca (O.) & Muniz (Julio). [In Portuguese & English.] Primeiro caso de infecção humana por *Waskia intestinalis* observado no Brazil. Algumas considerações sobre a legitimidade do genero *Waskia*. **First Human Case of** *Waskia intestinalis* **Infection observed in Brazil. Remarks on the Legitimacy of the Generic Name** *Waskia*.—*Sciencia Medica*. 1926. July 31. Vol. 4. No. 7. In Portuguese pp. 362-365. With 1 plate & 1 text fig. In English pp. 366–369.

This is a controversial paper distinguished—mercifully for the reader—by its urbanity.

The authors recently have been able to study very completely, living and stained, the intestinal flagellate described by Wenyon and O'Connor as *Waskia intestinalis*, and they here figure the active, dividing, and encysted forms of their own observation.

The senior author had previously studied in the same detail an intestinal flagellate from the American cockroach, which corresponded undoubtedly with Miss Mackinnon's genus *Embadomonas*, but differed from the now observed Waskia, particularly in the fact that the thicker of the two flagella " does not run along the cytostome neither is seen inside of it, but leaves its cavity immediately and runs outward."

The authors therefore dissent from Dobell's opinion that Waskia is identical and synonymous with Embadomonas.

The senior author also refers to the intestinal flagellate of a Brazil monkey described by him as *Waskia wenyoni*. Along with a brief description and figures of this species he gives an account of his early diffidence about its correct relations, and he now re-affirms the conclusion he came to when the genus *Waskia* was described, that it is the normal vegetative or adult form of that genus and not a dividing form. [An opinion in harmony with that originally expressed by Wenyon in the case of the geno-type *Waskia intestinalis*.]

A. A.

Callanan (J. C. J.). **Note on the Finding of *Embadomonas intestinalis* in a Kisii Native.**—*Kenya Med. Jl.* 1926. Sept. Vol. 3. No. 6. p. 170.

The author reports this as the first case on record for Kenya, mentioning also a hitherto unreported case observed in a Nandi boy by Dr. G. V. Allen.

A. A.

Andrews (Justin M.). **Coccidiosis in Mammals.**—*Amer. Jl. Hyg.* 1926. Nov. Vol. 6. No. 6. pp. 784–798. [16 refs.]

The observations recorded in this paper were based on cats. The author describes his technique very fully, and his care in getting kittens free from previous infection. The course of coccidiosis in these animals is summarized as follows :—

The period of incubation is from 2 to 4 days; the duration of symptoms does not usually exceed a week. The period from the time of inoculation until the appearance of oocysts in the stools (what the author calls "prepatent" period) is usually 5 or 6 days; the period during which oocysts continued present in the stools ("patent" period) averaged about 30 days. There was some indication that the severity of an infection varied directly with the dose inoculated. One attack of a specific coccidiosis appears to confer a specific immunity lasting for 7 months and probably for life.

From a comparison between his own observations in coccidiosis of cats and the case of human coccidiosis reported by A. Connal [see this *Bulletin*, Vol. 20, p. 447] and the congruity of the brief period during which clinical symptoms synchronize with the passage of oocysts in stools, the author is of opinion that human coccidiosis may be not uncommon, but may commonly be overlooked.

A. A.

Krijgsman (B. J.). Wie werden im Intestinaltractus des Wirtstieres die Sporozoiten der Coccidien aus ihren Hüllen befreit? [**The Excystation of Coccidia Sporozoits in the Host's Gut.**]—*Arch. f. Protistenk.* 1926. Vol. 56. No. 1. pp. 116–127. With 1 curve in text. [16 refs.]

Experiments here described and tabulated show that when *ripe* oocysts (from faeces of guineapig) were exposed to acid pepsin solution their wall was but slightly affected even after 24 hours—indeed was not very much more damaged than by treatment with HCl alone. When exposed to alkaline trypsin solution or to duodenum juice their wall

began to wrinkle usually in 6 hours (or less), and by 10 hours they had become emptied. When, however, they were exposed first to the pepsin solution for half-an-hour and then to the solution of the duodenal ferments some of them were found partly empty in 2 hours and had become almost empty in 3 or 6 hours.

A. A.

KRIJGSMAN (B. J.). Die Therapie der Kokzidiose. I. Teil: Die Kokzidiose der Kaninchen. [**The Treatment of Coccidiosis. Part I. The Coccidiosis of Rabbits.**]—*Cent. f. Bakt.* 1. Abt. Orig. 1926. Dec. 7. Vol. 101. No. 1/3. pp. 108–126. With 7 text figs. & 1 plate. [29 refs.]

A good deal of this paper is prefatory and familiar or formal. Rabbits were the subject of experiment, and the therapeutic effect of the two drugs tested was appraised by observations of faeces for cysts. These two drugs were atoxyl and creolin. From the experiments, which are described and graphically illustrated, the author concludes that atoxyl has no effect on coccidiosis. On the other hand creolin had a curative effect in every case and in every stage of the infection, the rabbits, it is to be understood, being kept scrupulously clean and dry and their food and cages undefiled.

A. A.

BECK (Harald). Die pathologischen Veränderungen in der Leber bei Vogelmalaria. [**The Pathological Changes in the Liver in Bird-Malaria.**]—*Arch. f. Wissenschaft. u. Prakt. Tierheilk.* 1924. April 25. Vol. 51. No. 1. pp. 90–98. With 21 figs. on 1 plate. [Numerous refs.]

The observations were made on siskins and canaries. In the series of pathological phenomena the author distinguishes three phases. First—about 8 days after infection—the intracellular reticulum of the liver parenchyma becomes infiltrated with large lymphocytes and other (smaller) forms of extravasated leucocytes. In the next phase—about 14 days after infection—the deposit of malaria pigment begins in the fixed cells, very seldom in the free cells, and owing to the extensive accumulation of extravasated leucocytes in the intracellular reticulum the parenchyma cells shrink. The third phase corresponds with a decrease in the number of parasites observed in the blood; the extravasated leucocytes and the pigment are now resorbed, and the large patches of shrunken parenchyma are reduced to small nodules.

A. A.

DRENSKY (Kosta) & HEGNER (R. W.). **Periodicity in Bird Malaria.**—*Amer. Jl. Hyg.* 1926. Mar. Vol. 6. No. 2. pp. 312–314. With 1 chart in text.

The authors have followed the asexual cycle of the parasite of bird malaria (*Plasmodium praecox*) and they confirm Mrs. TALIAFERRO'S observation of its periodicity. They note that Mrs. TALIAFERRO observed the period to be approximately 24 hours in a strain from a Baltimore sparrow, and approximately 30 hours in a laboratory strain that had been run through canaries for eleven years. In the authors' observations the period from one sporulation to another was 24 hours.

A. A.

Giemsa (G.), Weise (W.) & Tropp (C.). Chemotherapeutische Studien mit Vogelmalaria (*Plasmodium praecox*). [**Studies on the Chemotherapy of Bird-malaria.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1926. Aug. 1. Vol. 30. No. 8. pp. 334–347. [12 refs.]

The significance of this paper hardly comes into medical zoology. After a general review of previous work on the subject the authors tabulate the effects of 28 different preparations of specified chemical groups, of specified strengths, experimentally tested in the control of Proteosoma infection, including for comparison the known effects of 11 of them in Plasmodium infections of man. The authors' general conclusion is that under corresponding conditions of experiment, and with the employment of an identical strain of parasite, experiments with bird-malaria furnish a safe test of the value of a new drug for the treatment of malaria in man.

A. A.

Rodhain (J.). *Plasmodium epomophori* n. sp., parasite commun des roussettes épaulières au Congo belge. [**New Species of Plasmodium parasitizing Bats in Belgian Congo.**]—*Bull. Soc. Path. Exot.* 1926. Nov. 10. Vol. 19. No. 9. pp. 828–838. With 2 text figs. [5 refs.]

The new species of Plasmodium here described and figured has been observed as a common parasite of several species of frugivorous bats in Belgian Congo. It is undoubtedly distinct from the two species of Plasmodium observed respectively in frugivorous bats in Australia and India.

A. A.

Sato (Shinichi). **On the Toxic Action of Sarcosporidiotoxin and its Serological Study.**—*Japan Med. World.* 1926. Mar. 15. Vol. 6. No. 3. pp. 62–64. With 4 text figs.

This is an English summary, by the author, of his studes of the toxin of *Sarcocystis blanchardi*, a species said to occur in 56 per cent. of the buffaloes of Formosa. In his experiments the author used an extract of the dried "adult" cysts and cyst-contents (the toxin being soluble in water, in normal saline, and in glycerine).

The author has evidently made a very full and careful study, but his account of it is not as clear as it might be, and some of his terminology is ambiguous, particularly his use of the term "toxin" to include a specific toxin (also called a toxic principle) and its "antagonistic substance" as well as other toxins. This very broad use of the term tends to confuse the interpretation of the adjectival "toxicity." It is clear, however, that the specific toxic principle is destroyed by heat at 50°C. for 30 minutes, by CO_2, and by acids (particularly HCl), but is resistant to alkalis; is inert when swallowed or injected into the bronchi, weak when injected into the brain and weaker still into the peritoneum, but very active (in susceptible animals) when injected into the blood. The rabbit is particularly susceptible, the M.L.D. *intra venis* being 0·00005 gm. per kilo of bodyweight. Toxic symptoms—excitement, "paralytic collapse," and severe diarrhœa—ensue in about half an hour and death occurs in about 10 hours. The author enumerates all the post mortem pathological changes at great length and infers therefrom

that the toxic principle acts on the adrenal glands, the liver, the intestinal walls, and the heart. When the " toxin " [? extract of cyst] is brought in contact with a piece of any of these tissues *in vitro* the " toxicity " [manifestation of the " toxic principle "] disappears, or is very much reduced. Rabbits may be brought to a very high degree of immunity in the usual manner, but their immune serum, although it neutralizes the " toxin " *in vitro* does not always do so completely *in vivo*.

A. A.

DA MATTA (Alfredo). Dermatite produsida por larvas tartaranas ou lagarta de fogo. [**Dermatitis due to Caterpillar Larvae.**]—*Bol. Inst. Brasileiro de Sciencias.* Rio de Janeiro. 1926. July 1. Vol. 2. No. 7. pp. 255–262. With 2 figs.

———. A phytotherapia em clinica dermatologica e pediatrica.—*Ibid.* Aug. 10. Vol. 2. No. 8. pp. 275–278.

Two cases of acute dermatitis due to the hairy caterpillar of *Megalopyge lenata* are recorded. The first, a man, immediately experienced on contact a sensation of heat, followed by painful itching, swelling and acute inflammation. Twenty-four hours later there was a vesicular eruption which persisted for three days, but did not clear up entirely for ten days. In the second, a girl, the sensations and symptoms were similar but more severe.

In the second paper, the author states that local application of the leaves of the dahlia rapidly reduces the inflammation.

The tuber of *Dahlia variabilis* employed as a poultice is of value in other inflammatory conditions, such as cellulitis on the way to abscess-formation. Its alcoholic extract is also recommended for insomnia, nervous excitement, palpitation and as a general sedative in the complaints of infancy.

H. Harold Scott.

MAZZA (Salvador) & FRÍAS (Dardo). Nota sobre accidente producido por larvas de " *Hyperchira coroesus* " (rupa chico). [**Symptoms produced by Larvae of** *H. coroesus*.]—*Bol. Inst. Clin. Quirúrg.* Buenos Aires. 1926. No. 14, 15 & 16. 5 pp. With 1 text fig. [4 refs.]

The larva of the lepidopteron, *Hyperchira coroesus*, is 4–6 cm. in length by 1 cm. broad, of an emerald green colour and covered dorsally by closely-set up-standing hairs. It lives on bushes known locally as *guaranguay* (*Stenolobium garrocha* Fries, and *S. stans* Juss). The patient, a child of 3 years, was " stung " on the left lower eyelid by one of these larvae. There was much pain and a wine-red spot appeared, the size of a centavo piece. Similar spots soon arose over the whole face, not disappearing on pressure ; the skin was oedematous, the lid itself to such an extent as to impede vision. The swelling and redness did not completely disappear for 3 days. Constitutional symptoms were practically absent. The inhabitants are well acquainted with this accident and treat it by the local application of vinegar.

H. Harold Scott.

Illingworth (J. F.). [**Distressing Itch from a Moth,** *Euproctis flava* **Bremer, in the Orient.**]—*Proc. Hawaiian Ent. Soc.* Honolulu. 1925. July. Vol. 6. No. 2. pp. 267–270. [8 refs.] [Summarized in *Rev. Applied Entom.* 1926. Oct. Vol. 14. Ser. B. Pt. 10. pp. 182–183.]

The author reports a statement that whole villages in the neighbourhood of Yokohama may be incapacitated by epidemics of the irritating rash caused by contact with the hairs of the moth *Nygmia* (*Euproctis*) *flava*. The moths are attracted to lights and may get among bedclothing, where the hairs that they shed may remain virulent for weeks. [On the stinging-hairs of this and other moths and their caterpillars see this *Bulletin*, Vol. 19, p. 843; Vol. 20, pp. 472, 800, 801; Vol. 21, pp. 436, 789; Vol. 22, pp. 913, 917; and Vol. 23, p. 295.]

A. A.

Chapin (Edward A.). **A New Paederus (Coleopt.: Staphylinidae) causing Vesicular Dermatitis in Man.**—*Arch. f. Schiffs- u. Trop.-Hyg.* 1926. Sept. 13. Vol. 30. No. 9. pp. 369–372. [13 refs.]

The little Staphylinid beetles of the genus *Paederus* are now well known to emit a secretion that produces an irritating vesiculous eruption of the human skin. Several species, altogether 7 in number, distributed in tropical America, Europe, tropical Africa, India, and Java, have already been convicted of openly exercising this offensive power and 2 other species have been proved in the laboratory to have the same capacity. Under the indistinctive specific name *irritans* a tenth species is here described as causing epidemics of dermatitis in camps in Ecuador.

A. A.

Wada (Hiratake). Klinische und experimentelle Untersuchungen ueber die durch den Giftkäfer (*Paederus riparius* L.) verursachte Dermatitis und ihre Aetiologie. [**Aetiology of the Dermatitis caused by the Poison Beetle, Paederus.**]—*Japan. Jl. Dermat. & Urol.* 1926. Nov. Vol. 26. No. 11. German summary pp. 68–70. [In Japanese pp. 1044–1061. With 2 text figs. 8 refs.]

The author, in describing in much detail the dermatitis caused by *P. riparius*, states that he has found a pair of organs resembling glands in the penultimate abdominal segment of the insect. The irritant toxin, however, exists in all parts of the body [? blood], and is not confined to the region of the glands.

A. A.

Bogen (Emil). **Arachnidism: Spider Poisoning.** *Arch. Intern. Med.* 1926. Nov. 15. Vol. 38. No. 5. pp. 623–632. With 3 text figs.

The genus *Lathrodectes* (λαθροδηκτης = biting secretly)—often wrongly spelt "Latrodectus"—is widely distributed round the warmer zones of the globe and some of its species are notoriously venomous, their bite being fatal to small mammals and occasionally, it is said, to man himself. They are small but rather plump spiders, with long but coarsish legs, and are of a blackish colour with a somewhat alarming display of bright red or orange markings on the abdomen. The author, who speaks of experience of 15 cases of "poisonous spider bites"

(apparently or presumably inflicted by the notorious *Lathrodectes mactans*) treated in the Los Angeles Hospital, and includes in his survey 150 cases reported by thirty-three physicians in the U.S.A. during the last century, gives here (see also this *Bull.*, Vol. 23, p. 875) a comprehensive review of the behaviour of that particular species : but unfortunately his references to original papers have not been included in this article though they are stated to be present in reprints of it.

We quote his " Report of a typical case " :—

" One late summer evening, a young Mexican labourer, while sitting down in an infrequently used outdoor toilet in a suburb of Los Angeles, felt a sharp prick on the end of the glans penis. On looking down he saw a coarse web spun across the hole in the seat of the toilet, and a shiny black spider with a red spot on its belly scurrying to a corner of the web. After the first momentary stinging he felt no further pain in the penis, but about ten minutes later he began to feel a cramping, aching pain in the groins which rapidly spread over the abdomen, legs, back and chest, increasing in intensity for about an hour. He arrived at the Los Angeles General Hospital about six hours after the bite, writhing in agony, and complaining of nausea, vomiting, and of some difficulty in breathing.

" The face was flushed, the pupils somewhat dilated, the respiration accelerated, and the knee jerks and other reflexes overactive. The abdominal wall was extremely rigid, suggesting the boardlike rigidity of a perforated gastric ulcer, although there was no marked local abdominal tenderness. A tiny red spot, barely discernible, marked the spot where he had been bitten. The temperature was normal on admission, but rose to 100·6° F. by the next afternoon, while the pulse, which was 100 on admission, fell to 64. The blood pressure was 160 systolic and 90 diastolic, but fell to 130 systolic and 80 diastolic within twenty-four hours. A trace of albumin and a few hyaline casts were found in the urine. The patient had no bowel movements until after he had been given a cathartic on the second day, and he had some difficulty in voiding urine on the first day. The white blood count was 15,000 on admission, with 80 per cent. of polymorphonuclear leukocytes, but this dropped to 9,000 by the third day, with 70 per cent. of polymorphonuclears. The red blood count was normal, with a colour index of 1.

" Several hypodermic injections of morphine were given before the patient secured any relief from the pain, and an interrupted restless sleep followed the additional administration of 3 grains (0·1 Gm.) [*sic*] of phenobarbital. The morning after admission he was bathed in a profuse cold sweat, and complained of more pains in the feet and legs, and a numbness that persisted for several days in the soles of the feet. By the second day he was able to sit up, and four days after the onset of symptoms he left the hospital, walking but still weak and afflicted by a little numbness and tingling of the feet."

A. A.

Brazil (Vital) & Vellard (J.). Contribuição ao estudo do veneno das aranhas (Continuação). (Segunda memoria). *Lycosa raptoria* —*Ctenus nigriventer* Genero *Latrodectus*—Genero *Grammostola* —*Lasiodora curtior* e *Acanthoscuria sternalis*. [**Contribution to the Study of Spider-Venom (Pt. 2*).**] -*Mem. Inst. de Butantan.* 1926. Vol. 3. No. 1. pp. 243–294. With 23 figs. on 11 plates. French summary pp. 295–299. [8 refs.]

In these experimental studies the venom of the following South American spiders has been observed :

Lycosa raptoria.—The direct action of the venom is entirely local, causing intense pain and extensive superficial necrosis.

* For Part 1 see this *Bulletin*. Vol. 23. p. 301.

Ctenus nigriventer.—The general effects of the venom are shown in tachycardia and lowered temperature, cramps, convulsions and intense shooting pains, profuse sweat, and anuria—and are sometimes fatal.

Lathrodectes mactans.—The venom is neurotoxic, causing hyperaesthesia, intense shooting pains, tremors, paroxysms of cramp, and then paralysis, dyspnoea, and death.

L. geometricus.—The venom is generally similar to that of *L. mactans*, but is less virulent.

Grammostola acteon.—This is one of the largest of the Avicularíidae and is very common in southern Brazil. Its venom has hardly any effect on warm-blooded vertebrates but is extremely active for cold-blooded animals, particularly for snakes, upon which it feeds.

Lasiodora curtior, another very large Avicularíid, has venom similar to that of the Grammostola. It feeds on lizards and frogs.

Acanthoscuria sternalis.—A smaller Avicularíid; its venom is said to cause excitement and hallucination followed by paralysis, but to be not very potent; in an observed case in man it did not cause any serious effects.

A. A.

Vellard (J.). Contribution à l'étude des araignées. Nouvelles espéces d'Argiopidae. [**New Spiders from Brazil.**]—*Mem. Inst. de Butantan*. 1926. Vol. 3. No. 1. pp. 327–331. With 2 text figs. & 1 plate.

A new species of Glyptocranium (*G. fragoides*), one of the two Brazilian spiders here described, is said—unlike its congener *G. gastracanthoides*—to have venom that is little toxic.

A. A.

Lang (Milton C.) **A Case of Scorpion-Bite.**—*Indian Med. Gaz.* 1926. Nov. Vol. 61. No. 11. pp. 553–554.

Reported from the Central Provinces of India, where scorpion sting is said to be not uncommon but very seldom serious. The victim was a young man, and he was stung in the big toe. When seen, 15 minutes after the accident, he was in great pain and suffering from shock, but there was no local swelling. Presently there was urgent but ineffective desire to micturate, complaint of severe pain throughout the body, vomiting, cough with blood-stained expectoration, cyanosis, loss of radial pulse, and the cold sweats of approaching mortality. Under appropriate treatment for shock the patient was restored in the course of 2½ hours, but he remained unfit for work for two days. Successive examinations of urine showed that there had been a distinct, though transient, affection of the kidney as an effect of the scorpion venom—besides the transient effect upon the lungs. Sugar was not detected in the urine.

A. A.

d'Abreu (A. R.). **Effects of Bee Venom.**—*Indian Med. Gaz.* 1926. Nov. Vol. 61. No. 11. pp. 545–549.

The author, in Lahore, remarks the diversified symptoms that follow injuries inflicted by bees and wasps and illustrates the diversity by 5 cases. (1) A lady was stung on head, hands and arms by a sudden fall of bees from overhead. Though the individual stings were not acutely painful she was immediately smitten with an intolerable headache. About half-an-hour afterwards there set in symptoms as of

violent cholera—watery diarrhoea and vomiting, abdominal cramp, thirst, and collapse—lasting altogether 5 or 6 hours. Some pain from the stings was afterwards felt, and small hard lumps arose where stings had penetrated, the lumps lasting 10 or 12 days, but there was no general swelling or urticaria. (2) A lady travelling by road was furiously pursued by wild bees. She was rescued eventually by the ingenious and self-oblivious intervention of a poor Indian coolie, but not before she had been overwhelmed with stings on head and neck and arms. Her first complaints, afterwards, were an unquenchable thirst and a feeling of weight and " acute numbness " of the injured regions, but not any stinging pain. There was no general swelling or rash, but small hard lumps marked the sites of puncture by individual stings. About 12 hours after the struggle (during the night) the victim was semi-delirious, fevered, and in profuse perspiration. The following morning she felt well. The lumps remained for 3 to 5 weeks afterwards, feeling " frozen and numb " on pressure. (3) A man stung in a superficial vein of the foot, by a single bee, suffered serious embarrassment of breathing besides local swelling and urticaria. (4) A female patient prone to urticaria and susceptible to the smallest dose of quinine suffers severe urticaria if stung by a bee or wasp. (5) Another (male) patient with an unexplained susceptibility to urticaria suffers only local pain and swelling from a sting.

A. A.

Hase (Albrecht). Ueber die Giftwirkung der Bisse von Tausendfüssen. [**On the Action of the Venom of Centipedes.**]—*Cent. f. Bakt.* I. Abt. Orig. 1926. Aug. 5. Vol. 99. No. 4–5. pp. 325–332. With 4 text figs. [28 refs.]

The author has tried conclusions with the venom of some species of small European centipedes—*Lithobius insignis*, *Scolopendra cingulata*, and *S. oraniensis*. Their bite causes a burning pain quickly followed by a somewhat intensely erythematous skin eruption (local) which soon dies away without any serious consequences.

A. A.

Kraus (R.). Serumtherapie der Bisse europäischer Vipern. [**Serum Treatment of the Bite of the European Viper.**]—*Seuchenbekämpfung.* 1926. Vol. 3. No. 5–6. pp. 233–234.

The author's conclusions from laboratory experiments are that Vital Brazil's antivenene, the immunization product from *Lachesis jararaca* venom, is as efficacious against the venom of the European viper as Calmette's antivenene (the immunization product from the European viper).

A. A.

Moritsch (Paul). Zur Serumtherapie des Bisse durch europäische Vipern. 2. Mitteilung. [**Serum Therapy of Bites of European Vipers.**]—*Wien. Klin. Woch.* 1926. Dec. 23. Vol. 39. No. 52. pp. 1514–1515.

This appears to be merely a re-statement of the observations of R. Kraus, noticed above: (1) That the anti-toxic serum manufactured in Brazil for treating bites of S. American vipers neutralizes also the venom of European vipers; and (2) that this serum, as well as Calmette's standard antivenene, is curative of the bite of European vipers.

A. A.

Lindsay (J. W.). **Snake-Bite and its Treatment in South America.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1926. Nov. 25. Vol. 20. No. 4. pp. 275–278.

The author says that there are now very few estancias, gerba-matté plantations, or lumber-cutting concerns in Paraguay that are not provided with hypodermic syringes, potassium permanganate, and anti-venom serum, with clear instructions for their use. The antivenom sera are the well known antophidic, anti-bothropic, and anti-crotalic preparations of the São Paolo Institute of Brazil. He gives brief abstracts of the successful treatment of five cases of bite by species of Lachesis. In two cases treated locally by injection of permanganate, and otherwise by stimulants and calcium chloride, there seem not to have been any symptoms of poisoning; the other three cases, in all of which both local and general effects of absorption of venom were manifest, illustrate the remarkable efficacy of the polyvalent anti-ophidic serum.

A. A.

Austin (J. S.). **A Case of Snake Bite.**—*Jl. Roy. Nav. Med. Serv.* 1926. Oct. Vol. 12. No. 4. pp. 310–311.

This case is reported from Ceylon. The man, a naval A.B., wearing shoes and stockings, was bitten on the ankle. A resourceful and devoted shipmate immediately improvised an effective tourniquet and sucked the bite and endeavoured to cauterize it with a lighted match. The injured man walked back to camp, but had some difficulty in finishing the walk. When seen, about an hour after the accident, he was "somewhat collapsed," complained of pain in the abdomen, and was suffering—and continued for some hours to suffer—from constantly recurring vomiting. The only local symptom mentioned is slight general congestion due to the tourniquet. He was treated immediately with 40 cc. of antivenene [presumably Kasauli], large doses of whisky, and local ablution with strong $KMnO_4$. About 6 hours after the accident, when the patient was in bed, he complained of much-limited vision. Ptosis was then noticed. Subsequently difficulty in speaking and swallowing was complained of and observed. On the 3rd day this last symptom was alleviated; on the 6th day the eyes could be opened to the full and vision was nearly normal; and on the 7th day the patient felt well. During the 17 days that the patient was in hospital he lost 14 lb. weight.

The snake was not identified. From the symptoms it could hardly have been other than a krait that had tailed considerably in its bite.

A. A.

Wada (Hiratake). **Pharmacological Studies of Snake (*Agkistrodon Blomhoffii*) Venom.**—*Japan Med. World.* 1926. Nov. 15. Vol. 6. No. 11. pp. 308–315. With 1 curve in text.

This is a scrutinous study of the venom of the pit-viper *Ancistrodon Blomhoffii*, the venom used having been collected, dried, and sealed-up about 14 years before.

The general effect of several lethal doses, as observed in a mouse, is restlessness, within a few minutes, and quickening of respiration; then, in ten minutes or more, difficulty in walking, and slowed and laboured breathing; and then, after involuntary defaecation and urination, the breathing stops, though the heart continues to beat for several minutes afterwards. Occasionally there are "cramp-like movements" just before death. There are no haemorrhages in viscera or elsewhere.

The pharmaceutic effects of the venom on the circulation and respiration, on the blood vessels of divers animals and divers organs, on the heart, and on the movements of the intestine are stated, severally, in detail too restricted and too much qualified for concise abstraction; but the noteworthy effects appear to be lowering of blood-pressure, disturbance of respiration, and (in certain doses and certain animals) stimulation of the heart.

A. A,

Phisalix & Marcenac. La soi-disant immunité naturelle du chien Sloughi aux venins de scorpion et de vipère ainsi qu'au virus rabique. [**Supposed Natural Immunity of the Sloughi Dog to Scorpion and Viper Venom as well as to Rabies Virus.**]—*Bull. Soc. Path. Exot.* 1926. June 9. Vol. 19. No. 6. pp. 438–440.

The natives of Morocco have a belief, write the authors, that their "sloughi" hound is naturally immune to animal venoms and to the virus of rabies, and the native idea that this miraculously endowed breed is therefore altogether superior to the common cry of curs is too often a hindrance to the run of sanitary decrees against the spread of rabies. The authors, therefore, have formally tested the powers of resistance of the "sloughi" breed to the venoms of a large scorpion (*Buthus mauritanicus*) and a viper (*Vipera aspis*) and to the fixed virus of the Pasteur Institute, and they find them to be over-rated in the case of the scorpion venom and non-existent in the other two particulars. An adult "sloughi" (but not a pup) can tolerate the venom of a single scorpion, an amount that is sufficient to kill an ordinary dog of corresponding weight; but the venom of three scorpions is fatal. In the case of the viper venom and the fixed virus the "sloughi" was killed in the same way and in the same time and by the same lethal dose as the ordinary dog. The probable explanation of the "sloughi's" reputation, according to the authors, is that scorpions do not meddle with it because of its rough ill-favoured skin and hair.

A. A.

Crimmins (Martin L.). **Collecting Rattlesnake Venom to be used in making Antivenin Serum.**—*Jl. Amer. Med. Assoc.* 1926. Nov. 13. Vol. 87. No. 20. p. 1645. With 3 text figs.

The venom, expressed from the reptile in the usual way, is rapidly centrifugated for 15 to 30 minutes, when it separates into four layers; the upper two are removed and dried in an incubator at 37C° for 2–4 days.

It is stated that about two ounces of liquid venom, the yield of 200 specimens of *Crotalus atrox*, produced one ounce of dried "crystallized" venom.

A. A.

Brazil (Vital) & Vellard (J.). Contribuição ao estudo das glandulas das serpentes aglyphas. [**Study of Salivary Secretion of Aglyph Snakes.**]—*Mem. Inst. de Butantan.* 1926. Vol. 3. No. 1. pp. 301–322. French summary pp. 323–325. [17 refs.]

[It is well known that the salivary secretion of numerous species of Opisthoglyphous Colubridae is decidedly toxic, causing in laboratory

animals symptoms a good deal like those caused by dilute cobra-venom ; also that the saliva of some species of Aglyphous Colubridae is toxic, causing general convulsions.]

The author has experimented with the saliva of five S. American species of Aglyphs, namely *Drymobius bifossatus*, *Herpetodryas carinatus*, *Helicops modestus*, *Xenodon merremii*, and *Spilotes pullatus*. That of the last on this list is said to be hardly at all toxic ; that of the first two to cause paralysis but not to be haemolytic or coagulant ; while that of the two others, being also neither haemolytic nor coagulant, is otherwise toxic only for batrachia.

They have also made experiments with the saliva of the Boa constrictor and of a species of Amblycephalidae ; the former he finds to be non-toxic, while the latter is feebly neurotoxic but causes very extensive local sphacelation.

A. A.

Royer (M.). Étude des cellules sanguines, de l'hémoglobine de la bilirubine et de l'urobiline dans l'anémie hémolytique par le venin de cobra ou la lysocytine. [**Study of Blood Cells, Haemoglobin, Bilirubin, Urobilin in Cobra Venom Haemolysis.**]—*C. R. Soc. Biol.* 1926. Dec. 3. Vol. 95. No. 35. pp. 1375–1377. [1 ref.]

Observation of the haemolytic action of cobra venom is often interrupted by the intervention of the toxic effects.

Soon after the injection of venom the number of white cells is increased and the number of red cells very much diminished. The increase is great in polynuclears, little in mononuclears ; neutrophile myelocytes and eosinophiles appeared in one instance ; platelets are considerably decreased. In the red cells there is slight anicytosis, hyperchromasia, and rare occurrence of haematoblasts. There is a large, but temporary, increase of haemoglobin value, shewing that the freed haemoglobin is temporarily fixed by red cells ; but in certain cases haemoglobinuria follows. Faecal urobilin is considerably increased in the subsequent course of events. Bilirubinuria was never observed. The urobilin normal to bile disappears quickly, but is increased in the urine. The bilirubin of the bile is remarkably augmented. The appearance of faecal stercobilin was observed in three cases after administration of lysocytin. The animals used in the experiments were dogs.

A. A.

Marcenac (M.). Arachnides, myriapodes et serpents de la région du Tadla (Maroc). [**Spiders, Centipedes and Snakes of the Tadla Region, Morocco.**]—*Bull. Soc. Path. Exot.* 1926. July 7. Vol. 19. No. 7. pp. 560–563. [3 refs.]

The territory of Tadla in Morocco is described and its three physiographically well-defined regions –a stony waste plateau, with a desert fauna, to the north ; the hot, dry, shut-in valleys of the Atlas, also with a desert fauna, and a teeming womb of snakes, to the south ; and between the two a great well-irrigated fertile plain, less troubled with venomous creatures than the other regions.

Of the unpleasing elements of the Tadla fauna the following are mentioned : *Buthus mauritanicus*, a blackish scorpion, very common in summer and autumn, much feared for the serious effects of its sting,

which, however, is fatal (sometimes) only to children; *Heterometrus maurus*, a scorpion less common and less venomous than the other; *Galeodes olivieri*, a "jerrymunglum," like Ancient Pistol terrible only in aspect; *Scolopendra morsitans* var. *scolopiana*, and *Orya barbarica*, two centipedes whose venom merely causes irritation; *Scaphiostreptus maroccanus*, a millipede, like all of his kind quite harmless; and 3 or 4 species of snakes, of which the venomous species have not been certainly identified but are probably *Vipera lebetina* and (or) *Bitis*.

A. A.

Burgess (John). **Sting Ray Injuries.** [Correspondence.]—*Med. Jl. Australia.* 1926. Oct. 2. 13th Year. Vol. 2. No. 14. pp. 465–466.

This letter is inquisitive rather than informative. The writer mentions three cases of wounding by stingrays. In all three intense pain was felt, and is described as spasmodic in one case; in one case symptoms also of shock were noticed. In one instance the offending fish was caught; [from the incomplete description it seems to have been a very young individual].

A. A.

Pereira (Jayme R.). Sobre a acção physiologica do veneno do sapo. III-Veneno do sapo (*Bufo marinus*) e musculo liso. [**Action of Toad Venom on Unstriped Muscle.**]—*Mem. Inst. de Butantan.* 1926. Vol. 3. No. 1. pp. 177–184. With 6 text figs. [13 refs.] French summary p. 185.

Certain authors having on chemical evidence reported the presence of adrenalin in the venom of the toad, the author, not finding the physiological evidence very clear, has made a comparative study of the action of toad-venom and adrenalin on the unstriped muscle of various viscera of various laboratory animals. He finds that the venom of the toad in dilution of 1-500 to 1-5000 almost always has a stimulant action on unstriped muscle, even after the failure of adrenalin, but in certain cases where the normal tone of the muscle-preparation is high it can bring about an inhibition identical with Wedenski's inhibition.

A. A

Annales de Médecine et de Pharmacie Coloniales. 1926. Apr.-May-June. Vol. 24. No. 2. pp. 234–235.—Empoisonnement par la chair de crapaud. (Extrait du rapport médical de juillet 1925 de la Cochinchine.) [**Poisoning by Toad Flesh.**]

It is well known of toads that their cutaneous glands are venomous and that their blood also has been shown to be toxic, and the author here gives evidence that their flesh also is poisonous. Three native children in Cochin China ate some toads, which they had just before killed, skinned, and hastily cooked. Very soon afterwards they were taken with colic, painful vomiting, and profuse diarrhoea. One of them, a boy of 5 years, died at once; another, a girl of 11, died on reaching hospital; but the third, a girl of 8, recovered after the stomach and bowel had been irrigated and stimulants administered.

A. A.

Korsuizen (Th. F. J.). [illegible] Dutch New Guinea, Dutch East Indies. (Zweite Vorträge gehalten in Java, 1921, im Institut für Infektionskrankheiten zu Amsterdam.) **The Poisonous Creatures of Dutch East Indies.** [In German.] — *Nederlandsch Tijdschrift v. Geneesk. Indië.* 1928. Vol. 68. No. 2. 24 pp.

This is an interesting essay on a commonplace subject, but as it does not go beyond well-known facts and as the bibliography does not contain any references to original sources of information, it is not likely to be of much use to English readers.

Lévy (Robert). [illegible] **Poisoning of the Crayfish by Venoms of Two Myriapods.** — *C.R. Soc. Biol.* 1927. Feb. 4. Vol. 96. No. 4. pp. 256–257. [3 refs.]

It is stated that a lethal dose of the venom of the two centipedes specified causes in the crayfish immobility, abolition of reflexes, and the muscles, followed before death by complete relaxation. The venom of Cryptops is also haemolytic.

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A. A.

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REVIEWS AND NOTICES.

CELLI (Angelo). Storia della Malaria nell'Agro Romano. Opera postuma con illustrazioni del Dott. P. Ambrogetti e una Carta Topografica. [**The History of Malaria in the Roman Campagna.**] —*Mem. R. Accad. Lincei*, Rome. (Cl. d. Sci. fis. mat. e nat.) Series 6. Vol. I. Fasc. III. pp. 73–467. 1925. [Issued in December.] With 10 plates, a curve, and a map. (Città di Castello: Soc. Anon. Tipogr. "Leonardo da Vinci.")

ANGELO CELLI, formerly Professor of Hygiene in the University of Rome, is already well known for his pioneer work (with MARCHIAFAVA) on the malarial parasites, and also as the author of a little classic on malaria (1899) and as the leader, for many years, of a vigorous anti-malarial campaign in his native land. But it is not, perhaps, generally known that during the latter years of his life he was engaged in making an exhaustive historical study of malaria in the Roman Campagna. At the time of his death—in 1914, at the age of 57—he had fortunately written up the greater part of his results; and his voluminous manuscript, with its copious commentary and annotations, has at length been published posthumously (with additions by other hands) in the work under review. For this valuable legacy we have to thank the devotion of his widow and of his friends and pupils. Prof. G. CALZA has carefully revised the text, with the expert assistance of Drs. CANEZZA and GENOVESI on the medical side, of Profs. TURCHI and PINCHERLE in historical matters, and of a qualified engineer—DE TUCCI—in problems connected with irrigation and sanitation: while the Royal Academy of the Lincei, by shouldering the responsibilities of publication, has placed all students of epidemiology in general, and of malaria in particular, under a lasting obligation.

The author's aim, as stated in his own introduction (p. 82), was to trace the whole history of malaria in Rome and the Roman Campagna from prehistoric times down to the present day—a formidable task, since, as he pithily remarks elsewhere (p. 247), even the most accurate *historians** have, in the past, paid little or no attention to the sanitary condition of the stage whereon the events which they chronicle have been enacted.

At first sight, indeed, the difficulties of such an undertaking appear insuperable: but the author's erudition and ingenuity will soon convince most readers that his project is not merely feasible, but that malaria in Rome is even, perhaps, the most favourable of all subjects for historico-epidemiological inquiry. For there are probably few diseases more clearly recognizable than malaria, even in the casual allusions of non-medical writers; and there is probably no region of the globe richer in historical records than Rome—the centre of Latin civilization, and the headquarters of the Roman Republic, the Roman Empire, and the Roman Church. It is clear, therefore, that quite apart from the extant writings of numerous Latin and Italian historians, physicians, and naturalists—there must be vast untapped stores of data available to anybody possessed of the industry and knowledge necessary for their collection and collation.

Celli evidently had all the patience and scholarship requisite for this herculean labour. He has drawn his information from almost every conceivable source—from medical and scientific writers, from historians and archaeologists, from poets and novelists, from church records and papal bulls, from municipal regulations and parish registers and bills of mortality. He has ransacked the Latin and Italian classics, and has not neglected to read the tales of travellers and geographical gossips. Even local sayings, proverbs, lampoons, comic verses, and epitaphs, are occasionally made to give evidence. A large proportion of Celli's references, consequently, could only be verified by a person living in the Province of Rome, and familiar with local conditions, customs, history, and traditions.

* Italics in the original.

As all the sources indicated, with many others, have been utilized in preparing the present monograph, it will be clear that a detailed analysis of its matter is out of the question. Those interested must go to the original, whose contents can be but briefly described here.

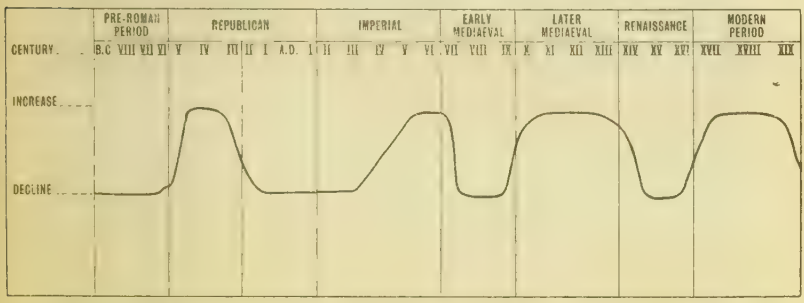
The work is divided into three main parts, dealing respectively with the Period of Antiquity (prehistoric times and Ancient Rome, pp. 91–122); the Middle Ages (pp. 125–273); and the Modern Period (15th Century to the present day, pp. 277–455). The whole is prefaced by an admirable Introduction (pp. 79–87), delivered in a concise and aphoristic style, and concludes with a remarkable attempt at a bibliography of the subject (Malaria in Rome and the Campagna) from 1802 to 1870. Most of the works here cited—of which there are over a hundred—are probably unknown and inaccessible to the majority of English students.

Evidence relating to the prevalence of malaria during these three historical epochs has naturally been obtained from different sources. Consequently, uniformity of treatment and argument was not to be expected, and the author's conclusions are not all equally well founded. For the oldest period, for example, most of the information available is archaeological, and derived from such unpromising material as can be extracted from a study of ancient sites of settlement, or from consideration of the import of the curious system of "drains" which prehistoric engineers burrowed in the Roman hills. For the somewhat later period, the classical Latin writers are exhaustively drawn upon, and their words ingeniously, though critically, interpreted. It may be noted in passing that, in dealing with the period of antiquity, the author makes some interesting comments on the goddess "Fever" (*Dea febris*, referred to by PLINY and others), to whom the early Romans raised altars and made placatory offerings. He also makes it plain that he does not countenance a belief in the Carthaginian origin of Roman malaria (*contra* W. H. S. JONES). Malaria, he says (p. 110), arrived at the gates of the city long before HANNIBAL.

For the "modern" period much documentary and other evidence is, of course, available, and the author has utilized it to the full. But it seems, at first sight, hardly possible to study Roman malaria during the Middle Ages; and it is therefore particularly interesting to see how Celli has attempted to bridge the historic gap between ancient and modern times. He has done it chiefly by a highly ingenious consideration of church history and agriculture during this period. His guiding principles appear to be sound, and are akin to those of the uniformitarian geologists. Recent events in the Campagna supply a key to earlier times: the present is merely a continuation of the past. Dense population or intensive cultivation of a particular area is, at the present day, incompatible with the presence of severe malaria. Districts now flourish and are populous because they are not malarious; abandoned districts are deserted because malaria has made them uninhabitable: and what is now happening must have happened many times before. Again, there is much scattered evidence of repeated attempts at irrigation in various areas—attempts which almost invariably failed. Why? Similar enterprises in recent times furnish an answer. Then again monasteries, hospices, and hospitals, are not now built, and do not now decay, without cause. The presence of a church implies the existence of a congregation; and the abandonment, removal, or refoundation of a church reflects corresponding vicissitudes in the life of the attendant community. Inquiry into the causes of such changing events—of which abundant historical records remain—leads in many cases to the unavoidable conclusion that malaria has exercised a dominating influence in the history of the Campagna.

We cannot here follow the author through all the multifarious paths which lead up to his principal conclusion. This is not, indeed, set out formally and finally, but is iterated or implied, time and again, throughout the whole work, and graphically displayed in the form of a curve at the end. Expressed as briefly as possible, it is that *malaria, like all other epidemic diseases, is a periodic phenomenon* (p. 81, *et alibi*). It develops in

waves, cycles, or rhythms, which recur with periodic frequency. The disease has, in the first place, a *daily* cycle—manifested as an intermittent periodic fever in the individual. Then it has a *monthly* cycle—certain types of malaria recurring regularly at definite seasons of the year (*e.g.* benign tertian in the spring, malignant in summer and autumn, quartan in autumn). Further, there is an *annual* cycle—a regular alternation of severe epidemics with mild outbreaks over a period of years. (According to Celli, statistics show that, since the middle of last century, the severe epidemics have recurred in the Campagna with approximately 10-yearly frequency, though intermediate 5-yearly fluctuations are also evident.) All these minor rhythms the author recognizes and accepts: his chief endeavour is to demonstrate that there has been, in addition, a grand cyclical development of malaria during the *centuries*—a rhythmical alternation of century-long periods when the disease was severe and devastating, with others when it was relatively mild and harmless. In earliest times (up to about 600 B.C.) malaria in the Campagna was mild. It became severe during the 5th, 4th, and 3rd centuries B.C., and then died down. It flared up again, however, during the 5th to 7th centuries A.D., which were followed by a return to the milder form once more. A severe period then recurred during the 10th to 13th centuries, after which the disease again became "attenuated"—only to blaze out anew in the 17th, 18th and 19th centuries. At the present time it is dying down—for the fourth time in its ascertainable history.



Graph of Decline and Increase in Malaria in the Roman Campagna throughout the centuries.

Whether or no the present waning of malaria in the Campagna is in any way due to hygienic efforts on the part of man, the author hesitated to affirm. He was fully alive to the fact that a similar decline in the power of the *Dea febris* had previously taken place more than once, without any evident human intervention to account for it. Moreover, he was not among those who believe that organized settlement and cultivation of the Campagna will ever, of themselves, succeed in stamping out malaria; for he well knew that such measures had already been repeatedly tried in vain. On the contrary, he was convinced that the area in question will never be habitable and cultivable unless malaria be first evicted. He knew the difficulties as few men can know them but was nevertheless an optimist—believing that knowledge is power, and that Science can overcome all obstacles. Consequently, his dreary tale of past failures and grievous visitations did not depress him; but, inasmuch as it represents a substantial addition to human knowledge, it even inspired him with hopes for the future.

A word must be said, in conclusion, about the illustrations accompanying this remarkable work. In addition to an informative map of the area under discussion, there is a series of excellent photographs—by Dr. P. Ambrogetti, one of the author's trusted henchmen—showing actual scenes

n the Campagna : while portraits of Cardinal De Lugo (who, in the 17th century, was largely instrumental in introducing quinine into Italy) and of the celebrated physician Lancisi (who had already divined in 1717 the part played by the mosquito in the aetiology of malaria) serve to enrich a monograph which is in every way worthy of the great scientific and historic traditions of its country of origin.

Clifford Dobell.

Manson-Bahr (Philip H.). [D.S.O., M.D., F.R.C.P.] & Alcock (A.) [C.I.E., LL.D., F.R.S., Lt-Col. I.M.S. (ret.), sometime Professor of Medical Zoology in the University of London at the London School of Tropical Medicine.]. **The Life and Work of Sir Patrick Manson.** pp. ix + 273. With 12 half-tone plates. 1927. London, Toronto, Melbourne & Sydney: Cassell & Co., Ltd. [16s.]

Sir Patrick Manson was undoubtedly a great man and it is fitting that his biography should have been written by two authors well equipped for a duty which it is clear they have regarded as a labour of love. Colonel Alcock has brought to the task, not only reverence for Manson and his attainments, but that mastery of the English tongue for which he is distinguished and which lends distinction to all his more important literary work. Dr. Manson-Bahr writes with almost a filial piety and yet is careful to refrain from fulsome admiration, from inordinate praise. Both authors knew Manson well in his prime and in his later years and subscribe to what has been called the Mansonian tradition, that blending of laboratory and clinical work, that building on a biological basis, that spirit of inquiry, tempered by sound judgment, which characterized the methods of the master.

The result is on the whole an admirable book, well balanced, carefully written and in many ways illluminating. "On the whole" we say, for, unfortunately, Manson in his earlier years, those strenuous years in China, remains a somewhat shadowy figure. It could not well be otherwise, for he outlived nearly all his contemporaries and so the authors were unable, with one trifling exception, to get accounts of him first-hand what time he sojourned in Formosa, practised and laboured at research in Amoy and, at Hong Kong, continued to follow his profession, the while he laid the foundations of modern medical education in that outpost of Empire. There is nothing shadowy, however, in the account of Manson's work in these places and Alcock unfolds the tale of his trials and discoveries and triumphs with a discernment and sympathy which rivet the reader's attention and excite his warm interest in a remarkable story of endeavour.

Patrick Manson, a son of the Laird of Fingask and a Blaikie on his mother's side, was born in the parish of Oldmeldrum in Aberdeenshire on October 3rd, 1844, and, even as a child, betrayed an interest in natural history. Destined for the engineering profession, he developed a physical infirmity, the result of trying to do men's work while still immature, and as a result abandoned engineering for medicine. He entered the University of Aberdeen in 1860 and studied there and also to some extent at Edinburgh. He passed the final examination at Aberdeen before he was twenty, too young to graduate, and so proceeded to London, visiting schools, hospitals and museums, and thereby laying a sure foundation for what was to follow. After taking his M.B., C.M. in 1865 he served for some time as Assistant Medical Officer to the Durham Lunatic Asylum and, while so doing, made his first contribution to medical literature in the form of a paper which, as a thesis, gained for him the M.D. of his Alma Mater. His adventurous spirit presumably chafed at the limitations imposed by asylum work and so, in 1866, he fared foreign, having obtained the appointment of Medical Officer for Formosa to the Chinese Imperial Maritime Customs, a service at that time directed by the famous Sir Robert Hart. Manson was nearly 5 years in Formosa, but we hear little of his life there and learn only that he had plenty

to do, was, as ever, observant and a careful note-taker and so prosperous that, at the age of 25, he was able to repay his father the £700 which had been spent on his medical education, an earnest of that fine independence of spirit and self-reliance which marked his future career.

In 1871 Manson moved to Amoy, which was to be his home for 13 years, and we are given an account of his varied activities, amongst them his prowess with the gun, for, throughout his life, he remained a keen sportsman, skilled with both rod and fowling-piece. The picture of Amoy is slight but the description given of Manson's human environment and the way he dealt with it is interesting. Surgery occupied much of his time and his success in dealing with elephantiasis of the scrotum and vesical stone served to establish his reputation and at the same time to line his pockets. Always a wise man, Manson took a leaf out of the book of the native Chinese practitioners and abolished the secrecy, or rather remoteness, which had been a feature of European practice, thereby gaining the confidence of the inhabitants. His adventures in attempting post-mortem work in the face of difficulties and, indeed, dangers, his hospital experiences and his efforts at training students in western medicine, frustrated in large measure by a " hot-gospeller " of a missionary, provide material for a chapter which is followed by one that recounts more intimately his medical and surgical activities and incidentally reveals the vast field of experience to which he had access at Amoy. It was there he became familiar with liver abscess and, not content with existing surgical procedure, introduced his trocar and cannula, still used under certain conditions. It was there, with his microscope, he searched the " juice " from leprotic nodules and encountered, in the same year that HANSEN discovered them, the lepra bacilli, although he did not appreciate the significance of the rod-shaped bodies which he tried to cultivate. It was there he differentiated *Tinea imbricata* and first commenced the study of the blood in malaria, and it was there, in the midst of all his other work, oppressed by the cares of practice, far from skilled help and advice, that he made his great discovery and incriminated the mosquito as the intermediate host of the parasite of human filariasis.

Chapter IV tells the story, but it begins with his return to England in 1874, his marriage in 1875, his eye work at Moorfields and his pathetic quest in London for enlightment into the problems of tropical pathology. Like the dove from the Ark, Manson found no foothold, his solitary grain of comfort, so far as chyluria and elephantiasis were concerned, being the record of the observations of Timothy LEWIS, that godfather of tropical medicine, upon *Filaria sanguinis hominis* in Calcutta. This grain of comfort became also, as Alcock puts it, a grain of mustard seed which he carried back with him to Amoy, where " it grew into one of the greatest amongst herbs for the service of men whose pabulum is Tropical Medicine."

A brief but adequate and accurate account of the history of filaria is followed by an exposition of Manson's work on the subject—work characterized by openness, breadth and unpretentiousness, as the biographer puts it. How interesting is it to read that Manson made some of his observations on the filaria of the white-necked crow when only the other day WAIL, POPOW and PRJADKO of Moscow recorded their investigations on the filariasis of crows and expressed the hope that their observations would indicate the importance of a more exhaustive study of the pathological manifestations of human filariasis. The tale of the solving of the chief part of the filariasis puzzle has often been told, but never better nor more fully than in this book. A letter from Manson to COBBOLD is forthcoming as is one from LEWIS to Manson. The latter's careful reasoning, intuition, patience, dogged perseverance and mistakes are all revealed to us and so are the indifference and hostility with which his discovery was received by part of the scientific world. The full significance of his findings, the momentous nature of his revelations are here made apparent, but so are the shortcomings in his work, for Manson throughout clung to his idea that the filarial larvae were imbibed in drinking-water after escaping from the

drowned mosquito. It was not, indeed, until 1900 that Low set the seal to Manson's early work by adducing proof that the filaria entered the blood of man from the mosquito's proboscis. In this connexion the wording in the book on page 59 is, perhaps, a little unfortunate, as it might possibly be held to question the priority of Low's work which, so far as the reviewer knows, has never been in doubt. It therefore seems advisable to quote from an annotation which appeared in the *British Medical Journal* for May 6th, 1900, and which runs as follows :—

" By a happy stroke of the sectioning knife passing through the entire length of the proboscis of a filariated mosquito Dr. E. (*sic*) C. Low, who has been working under Dr. Manson for some time at the London School of Tropical Medicine, has been able to bring strong evidence to prove that the filaria leaves the mosquito by way of the proboscis. In the section referred to the parasite can be seen coiled up in the head of the mosquito, lying under the cerebral ganglia and stretching along the entire length of the proboscis. The preparation seems to show that the filaria is communicated to man by the bite of the mosquito. This important discovery not only revolutionises our ideas as to the precise way in which the mosquito conveys the filaria to man, but by analogy lends support to the truth of Ross's inoculation theory of malaria."

In any case, if Low was first in this field, S. P. James, whose observations are mentioned, and whose letter on the subject to Manson is transcribed, was a very good second.

We are so apt to think of Manson in terms of filaria and malaria that information on the amount of miscellaneous scientific work he accomplished in Amoy, some of it distinctly important, comes as a surprise. Yet it but serves to emphasize his keen spirit of inquiry, that constant mental alertness so exceptional in such a place of residence.

Hong Kong, whither he migrated when close upon 40, provided him with a wider field and also enlarged the scope of his energies, converting him into the best type of publicist. It is true that preventive medicine did not specially appeal to him—he once said to the present reviewer, " Don't talk to me about water-closets "—his mind being set chiefly on the causation of disease and on the biological problems connected with its etiology ; yet, for all that, he played a leading part in the establishment of a Dairy Farm run on hygienic lines and which still exists as a flourishing business concern. His greatest work in Hong Kong, however, was his contribution to the cause of medical education, and one of the finest things in his biography is the speech he made at the opening of the College of Medicine for Chinese, a statesmanlike utterance revealing his breadth of mind and wideness of outlook, as well as a negation of self altogether admirable.

The scene shifts to London, and we get a more intimate picture of him than heretofore and mark how, slowly but surely, he made his way and how the same characteristics which had spelled success in China enabled him, in the face of opposition and even ridicule—he was dubbed " Mosquito Manson "—to establish himself firmly in the Metropolis and to attain some at least of his ideals. Amongst them was the foundation of the London School of Tropical Medicine, thanks in the first instance to his close and most profitable association with the Seamen's Hospital Society and in the second to the support accorded him by Joseph Chamberlain.

His life in London was a very full and interesting one, joyous also, though for a time clouded and saddened by the death of his eldest son. Manson, however, was not a man to repine. For one thing he was always much too busy, for another he had varied interests, for yet another he had an urbane and patient disposition which never fretted unduly against the bludgeonings of fate. He soon made a reputation as a teacher of clinical medicine, and the reason is not far to seek when one reads his graphic description of the life-history of the guinea-worm. Manson in his speech was often pithy. At times he could be both pithy and pungent. A very considerable section of the book is devoted to the Mosquito-Malaria Theory, which is enunciated in a painstaking and critical fashion and vividly supplemented by the remarkable series of letters which Manson addressed

to Ross, the man of his choice, when the latter was toiling laboriously in India for the proof which was so hard to find. These letters, linked here and there by text, tell a graphic tale and throw fresh light on the relations between the two men which Mr. Neville CHAMBERLAIN likened the other day to those existing between DARWIN and WALLACE. A mere review cannot do justice to the story; but it may be said that the part played by Manson is well defined, the part played by Ross frankly and fully acknowledged, and the greatness of their joint achievement duly emphasized. At the same time, there would seem to be a tendency here, as also in the filariasis account, not indeed to conceal Manson's limitations, but to find excuses for them. It is very natural, and there is much truth in what is said, but Manson was big enough to make mistakes without any necessity for explanation, and it might, perhaps, have been better to state them and to let them stand. It will always be a matter of surprise that Manson's imagination and reasoning powers did not lead him, sooner or later, to the real method whereby the mosquito infects man either with the filaria or the malaria parasite. The biggest and best brains may be the victims of a preconceived notion or obsession. The chapter on "Further Contributions to Science" gives a good idea of Manson's wide range and recalls how much we owe to him, especially in the helminthological field. That on the London School of Tropical Medicine is a trifle disappointing in that very little is said about the band of pioneers that Manson gathered about him and who aided him in his enterprise. CANTLIE, SIMPSON, DUNCAN, Oswald BAKER, HEWLETT, SAMBON, REES, DANIELS, LOW and, at a later date, SANDWITH, we would have liked to hear a little more about them when the School was in the making and about their relations to the Chief. Some, it is true, are mentioned, but a picture of the early days and the group that used to gather on the station platform at Connaught Road would have added interest to the account given and would in no way have detracted from the central figure.

Some exception must be taken to the statement made in connexion with the position of tropical medicine at the time the School was founded. It is to this effect: "As to tropical disease, books of an inferior order, based mainly on hearsay, very little on actual experiment, had been written on the subject, but they were few and their readers limited in numbers." Such a criticism is unjust to the pioneers in tropical medicine. Or ever Manson wrote his famous manual there existed a large literature on tropical diseases and some of the treatises were of a very high order. One need only cite an important and comprehensive work like MARTIN'S "Influence of Tropical Climates on European Constitutions," the lineal descendant of JOHNSON'S earlier tome, DAVIDSON'S "Hygiene and Diseases of Warm Climates," to which Manson himself contributed and, more especially, perhaps, that wise "Commentary of the Diseases of India" by Norman CHEVERS, embodying the ripe experience of a great clinician to which Manson was indebted for some of his own knowledge. It is of course true that these books had the limitations belonging to the period when they were written, but it is worth remembering, and it in no way belittles Manson, that he was not, as stated in this biography, the "Father of Tropical Medicine," but the "Father of *Modern* Tropical Medicine," and this is the title which Raphael BLANCHARD so fittingly bestowed upon him.

The concluding portion of the book is written with sympathy and insight. In "The Closing Scenes" we see him an old man full of years and honours, crippled by the gout, his life-long enemy, but still enthusiastic and thorough, whether he was dealing with the affairs of his beloved School or casting for trout on Lough Mask or on his native Donside. Even at the end his thoughts were concerned with the advance of research work and the future of his School and he was writing about the latter and also about a Manson Scholarship which he wished to found when the call came and he rested from his labours. The last chapter is called "Manson's Philosophy of Life," and tells us a good deal about his personality and his sane outlook on men and things. It is illuminated here and there by a story, a saying or a letter

and anyone who reads it will agree with its writer that Manson belonged to the company of those who " warmed both hands before the fire of life."

The book is what it purports to be, an account of Manson's life and work, and it is a good account, written with care and discretion. Considering that it is by no means easy to compress the events of such a long and active and memorable career into some 240 pages, it is wonderfully complete and it appears to be an accurate and fair presentation while, as has been said, it reflects credit on its authors in virtue of its well regulated enthusiasm and the clarity of its exposition. Yet it lacks something, and that something would seem to be the impressionist touch which marks the highest art of the biographer and which alone can make the dead man live. In one place, and in one place only, do we get a wholly satisfying word etching of the Manson we knew and followed, and that is from the pen of HANSCHELL. In two pages he brings back to memory the benign and impressive figure, the kindly yet serious clinician to whose weighty words his students listened with a stillness which testified to their value. Yet it would be ungracious and unfair to find fault in any way with the fine tribute the joint authors have paid to Manson's memory because this rare and elusive gift is not in evidence. They have given of their best and have produced, not only a sound and interesting book, but a fitting testimony in text and illustration to one who did much for Science and even more for humanity.

Andrew Balfour.